

4. Sci 2:99/I  
[COMMITTEE PRINT]

COMPLETED  
88

VISIT TO SWEDEN AND THE SOVIET UNION

MF 128  
ORIGINAL  
REPORT

PREPARED BY THE

SUBCOMMITTEE ON  
SPACE SCIENCE AND APPLICATIONS

TRANSMITTED TO THE

COMMITTEE ON SCIENCE AND TECHNOLOGY  
HOUSE OF REPRESENTATIVES

NINETY-NINTH CONGRESS

FIRST SESSION

Serial I



OCTOBER 1985

Printed for the use of the Committee on Science and Technology

U.S. GOVERNMENT PRINTING OFFICE

57-325 O

WASHINGTON : 1986

2  
I  
BEST COPY AVAILABLE

## COMMITTEE ON SCIENCE AND TECHNOLOGY

DON FUQUA, Florida, *Chairman*

ROBERT A. ROE, New Jersey  
 GEORGE E. BROWN, Jr., California  
 JAMES H. SCHEUER, New York  
 MARILYN LLOYD, Tennessee  
 TIMOTHY E. WIRTH, Colorado  
 DOUG WALGREN, Pennsylvania  
 DAN GLICKMAN, Kansas  
 ROBERT A. YOUNG, Missouri  
 HAROLD L. VOLKMER, Missouri  
 BILL NELSON, Florida  
 STAN LUNDINE, New York  
 RALPH M. HALL, Texas  
 DAVE McCURDY, Oklahoma  
 NORMAN Y. MINETA, California  
 MICHAEL A. ANDREWS, Texas  
 BUDDY MacKAY,\*\* Florida  
 TIM VALENTINE, North Carolina  
 HARRY M. REID, Nevada  
 ROBERT G. TORRICELLI, New Jersey  
 FREDERICK C. BOUCHER, Virginia  
 TERRY BRUCE, Illinois  
 RICHARD H. STALLINGS, Idaho  
 BART GORDON, Tennessee  
 JAMES A. TRAFICANT, Jr., Ohio

MANUEL LUJAN, Jr.,\* New Mexico  
 ROBERT S. WALKER, Pennsylvania  
 F. JAMES SENSENBRENNER, Jr.,  
 Wisconsin  
 CLAUDINE SCHNEIDER, Rhode Island  
 SHERWOOD L. BOEHLERT, New York  
 TOM LEWIS, Florida  
 DON RITTER, Pennsylvania  
 SID W. MORRISON, Washington  
 RON PACKARD, California  
 JAN MEYERS, Kansas  
 ROBERT C. SMITH, New Hampshire  
 PAUL B. HENRY, Michigan  
 HARRIS W. FAWELL, Illinois  
 WILLIAM W. COBEY, Jr., North Carolina  
 JOE BARTON, Texas  
 D. FRENCH SLAUGHTER, Jr., Virginia  
 DAVID S. MONSON, Utah

HAROLD P. HANSON, *Executive Director*  
 ROBERT C. KETCHAM, *General Counsel*  
 REGINA A. DAVIS, *Chief Clerk*  
 JOYCE GROSS FREIWALD, *Republican Staff Director*

## SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS

BILL NELSON, Florida, *Chairman*

GEORGE E. BROWN, Jr., California  
 MICHAEL A. ANDREWS, Texas  
 ROBERT G. TORRICELLI, New Jersey  
 BART GORDON, Tennessee  
 JAMES H. SCHEUER, New York  
 HAROLD L. VOLKMER, Missouri  
 NORMAN Y. MINETA, California  
 RALPH M. HALL, Texas

ROBERT S. WALKER,\* Pennsylvania  
 JAN MEYERS, Kansas  
 ROBERT C. SMITH, New Hampshire  
 JOE BARTON, Texas  
 D. FRENCH SLAUGHTER, Jr., Virginia  
 DAVID S. MONSON, Utah

\*Ranking Republican Member.

\*\*Serving on Committee on the Budget for 99th Congress.

# CONTENTS

|                                                   | Page |
|---------------------------------------------------|------|
| Letter of Transmittal .....                       | v    |
| Introduction .....                                | vii  |
| Overview .....                                    | 1    |
| Potential Areas of Cooperative Activity .....     | 5    |
| Unmanned Missions:                                |      |
| International Geosphere Biosphere Program .....   | 6    |
| International Space Year .....                    | 7    |
| Life Sciences .....                               | 8    |
| Lunar Orbiter .....                               | 10   |
| Mars Phobos Mission .....                         | 11   |
| Mars Sample Return .....                          | 12   |
| Radioastronomy .....                              | 13   |
| Remote Sensing .....                              | 14   |
| Solar Terrestrial Physics .....                   | 16   |
| Venus Radar Mapper .....                          | 18   |
| Manned Missions:                                  |      |
| Flight crew exchanges .....                       | 20   |
| Joint rescue demonstration .....                  | 21   |
| Jointly manned mission to the Moon and Mars ..... | 22   |
| Shuttle/Salyut docking .....                      | 23   |

## SITE VISITS

|                                                                |    |
|----------------------------------------------------------------|----|
| October 12, 1985:                                              |    |
| Country Team Briefing—Sweden .....                             | 24 |
| The 36th International Astronautical Federation Congress ..... | 26 |
| October 13, 1985:                                              |    |
| Country Team Briefing—Soviet Union .....                       | 28 |
| Economic Achievement Center .....                              | 31 |
| Mission Control Center .....                                   | 32 |
| Institute for Bioorganic Chemistry .....                       | 34 |
| Institute for Space Research .....                             | 36 |
| October 14, 1985:                                              |    |
| U.S.S.R. Academy of Sciences .....                             | 38 |
| Institute for Biomedical Problems .....                        | 43 |
| October 15, 1985: Star City .....                              | 45 |

## APPENDICES

|                                                                                                                                         |    |
|-----------------------------------------------------------------------------------------------------------------------------------------|----|
| Press Statement of Delegation, Moscow, October 16, 1985 .....                                                                           | 47 |
| Chronology of U.S.-U.S.S.R. Space Cooperation .....                                                                                     | 54 |
| U.S.-U.S.S.R. Space Cooperation .....                                                                                                   | 55 |
| Bilateral Science and Technology Agreements .....                                                                                       | 57 |
| Agreement between the U.S. and U.S.S.R. Concerning Cooperation in the<br>Exploration and Use of Outer Space for Peaceful Purposes ..... | 62 |
| Joint Resolution Relation to Cooperative East-West Ventures in Space, P.L.<br>98-562 .....                                              | 64 |
| Site Descriptions .....                                                                                                                 | 67 |
| Flight Control Center .....                                                                                                             | 67 |
| Institute of Biomedical Problems .....                                                                                                  | 68 |
| Space Research Institute .....                                                                                                          | 69 |
| U.S.S.R. Academy of Sciences .....                                                                                                      | 70 |
| Intercosmos Council .....                                                                                                               | 72 |
| Star City .....                                                                                                                         | 74 |
| Report on hearings regarding Potential U.S.-U.S.S.R. Cooperation in Space,<br>July 1985 .....                                           | 75 |

**BLANK PAGE**

## LETTER OF TRANSMITTAL

Hon. Don Fuqua, Chairman  
Committee on Science and Technology  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

I am forwarding for your attention this report on my delegation's visit to Sweden and the Soviet Union conducted between October 11 and 16, 1985. The report includes the highlights of individual site visits as well as a summary of our impressions gathered during the trip.

The delegation's visit to the Soviet Union was to assess prospects and opportunities for civilian space cooperation between the United States and the Soviet Union. Our mission was to gather insights into the Soviet scientific and policymaking establishment as well as to do our part, as legislators, to encourage civilian space cooperation with the Soviets. We did not travel to negotiate, but to explore opportunities in space cooperation. I believe in that regard we were successful in learning and understanding more about our Soviet counterparts.

Although the delegation found that the climate in the Soviet Union is not receptive to reestablishment of a formal working agreement in space exploration due to the status of current arms control negotiations, we did find interest in and receptivity to our ideas and informal proposals. These are described herein. I believe there exists strong potential for building a base for future space cooperation with the Soviet Union. I commend this report to your attention.

Sincerely,



BILL NELSON, Chairman  
Subcommittee on Space Science  
and Applications

(A)

BEST COPY AVAILABLE

**BLANK PAGE**

## INTRODUCTION

From October 11-16, 1985, the Subcommittee on Space Science and Applications of the Committee on Science and Technology visited the Soviet Union to discuss potential cooperation in civilian space programs between the United States and the Soviet Union. The delegation was led by Subcommittee Chairman Bill Nelson. The official visit followed hearings held July 30 and 31, 1985 by the Subcommittee, which were conducted in order to assess the potential gains and drawbacks of civilian space cooperation with the Soviet Union. The delegation's visit was undertaken in the spirit of promoting scientific cooperation between the two nations. The trip and hearings also coincided with the tenth anniversary of the Apollo-Soyuz Test Project, and the delegation was fortunate enough to be accompanied by two of the American ASTP astronauts, General Tom Stafford and Donald K. (Deke) Slayton.

The trip included a morning stopover in Stockholm, Sweden, where the Members were briefed by the American Ambassador and staff of the American embassy.

Members participating in the trip included:

### Committee on Science and Technology

Bill Nelson, (D-FL)  
Manuel Lujan, Jr., (R-NM)  
Robert A. Young, (D-MO)  
Robert S. Walker, (R-PA)  
Robert G. Torricelli, (D-NJ)  
Donald L. Ritter, (R-PA)

### Committee on Appropriations

Lawrence Coughlin, (R-PA)

(VII)

BEST COPY AVAILABLE

## OVERVIEW

From October 11-16, 1985, a Congressional delegation led by Congressman Bill Nelson, Chairman, Subcommittee on Space Science and Applications, Committee on Science and Technology journeyed to the Soviet Union. The purpose of the delegation's visit was to explore and gain first hand insight into Soviet attitudes toward renewed cooperation in space. The trip also provided an opportunity to visit various facilities dedicated to the Soviet space program which in some cases had not been seen by Westerners in a decade.

The delegation's visit to the Soviet Union followed hearings held July 30 and 31 by the Subcommittee on Space Science and Applications concerning potential U.S./U.S.S.R. cooperation in space.<sup>1</sup> (A brief report on the hearings is contained in Appendix I.)

The delegation's trip was motivated in part by the strong consensus apparent at the hearings that some level of scientific cooperation is both desirable and beneficial to the United States. Questions continue to exist concerning the optimum level of cooperation and, in particular, issues of technology transfer.

The hearings were revealing in the perspective they offered on U.S. Soviet cooperation in space, i.e., that both the receptiveness to and the effects from Soviet space cooperation depend largely on the overall political relationship between the two nations. In other words, space cooperation can neither significantly influence, nor sustain, general relations between the United States and the U.S.S.R. Rather, space cooperative relationships can occur as an outgrowth of a positive bilateral relationship.

The delegation's visit, as well as the hearings, were deliberately timed to coincide with the tenth anniversary of the Apollo-Soyuz Test Project, a mission whose success marked a high point in U.S.-Soviet relations.

U.S.-Soviet space cooperation has deteriorated significantly in recent years, having suffered significant impairment due to the lapse of the U.S.-Soviet Space Agreement concerning Cooperation in Exploration and Use of Outer Space for Peaceful Purposes. The U.S. chose not to renew the treaty in 1982 following Soviet imposition of martial law in Poland.

Despite the absence of a formal governmental agreement or other more encouraging circumstances, some informal individual scientific exchanges have continued. Official overtures have also been made. In 1984, President Reagan extended an invitation to the Soviets to participate in a simulated joint rescue mission. To date, no favorable

---

<sup>1</sup>Hearings No. 23, July 30 and 31, 1985.

response has been received from the Soviets. There have surfaced, however, signs of greater openness in the Soviet space program, suggesting at least some willingness on the part of the Soviet Union to take steps to reinvigorate the cooled relationship.

The Subcommittee's hearings were scheduled in order to understand the Administration's policy position on U.S.-U.S.S.R. Civilian Space Cooperation prior to the November summit meeting between President Reagan and General Secretary Gorbachev. Although civilian space cooperation was not an agenda item for the Summit, a successful outcome at the Summit was seen as a major stepping stone leading toward a stronger relationship between the United States and the Soviet Union in space.

Based on the expression at the hearings of positive, albeit cautious support for enhanced cooperation with the Soviets, the Subcommittee took steps to arrange a visit to the U.S.S.R. Although the delegation did not go to the Soviet Union to negotiate formally, there was a strong sense that a visit of the delegation could contribute to improved relations between the two superpowers and make some headway to open doors through which greater scientific and space cooperation could occur.

The Subcommittee received an invitation to visit the Soviet Union from the U.S.S.R. Academy of Sciences and this was considered a positive indication of interest on the Soviet side for pursuing discussions of mutual interest and benefit. In this context the delegation's visit can be considered an unequivocal success. The delegation was warmly received by its hosts, and the tone and comments made by Soviet officials and scientists suggested strong interest in forging a productive, cooperative relationship in civilian space cooperation. The delegation received clear signals that cooperation in space is a mutual, and achievable, goal.

Prior to the delegation's departure, the Members were thoroughly briefed by the following agencies and organizations:

National Aeronautics and Space Administration  
Library of Congress, Congressional Research Service  
Department of State  
National Oceanic and Atmospheric Administration  
Office of Technology Assessment  
Central Intelligence Agency  
Commission on Soviet Jewry

As a result of these briefings, as well as the Subcommittee's hearings, the Members approached discussions with the Soviets guided by certain criteria as a basis for exploring civilian space cooperative projects. Some of these principals include:

- o Compatibility: Joint programs should be compatible and consistent with U.S. space program and strategy. Mission planning and phasing should be sought within NASA budget parameters.

- o Return: Joint programs should result in real scientific return on the investment the United States makes in the bilateral relationship, and this return should be proportional to the return on other projects.
- o Delayed costs: Joint programs should help reduce costs of what might otherwise be unilateral programmatic or mission investment.
- o Reciprocity: The investments made by the United States in this and any bilateral undertaking should be reciprocated, in order to assure continued cooperation.
- o Protection from technology transfer: Technology transfer should be non-existent or minimized.

U.S.-U.S.S.R. space cooperative activity can be viewed on a continuum, with levels characterized by the intensity of cooperation and associated political commitment. For example, despite the absence of a formal framework, a limited amount of cooperation between the U.S. and U.S.S.R. does continue today. However, absent mutual and formal political endorsement, there exists no means by which reciprocity can be assured. That is to say, when the U.S.S.R. agrees to work cooperatively with an individual U.S. scientist, there is no way to assure that the U.S. gets as much as it gives. Although the present situation suggests that a formal agreement would be considered by the Soviets only as an aftermath to some successful resolution of their concerns related to Strategic Defense Initiative, it was the Delegation's sense that a formal framework for civilian space cooperation is a desirable means of enhancing civilian space cooperation with the Soviet Union. In the view of the delegation, a formal framework would benefit the United States by lending structure for cooperation, strengthening channels for communications, and providing leverage for assuring a return on the national investment in the relationship. In the near term, the delegation believes that closer informal cooperation should be sought in order to provide a basis for the future establishment of a formal framework.

**BLANK PAGE**

## POTENTIAL AREAS OF COOPERATIVE ACTIVITY

In the following chapter there are brief descriptions of potential areas of cooperative activity between the U.S. and the U.S.S.R. These proposals, while not formal, reflect topical areas that were raised by the delegation during discussions with Soviet officials in October. One can contemplate various levels of collaborative involvement with the Soviet Union. Each "level," described below, suggests a cooperation scenario with varying degrees of intensity.

### Level 1: Exchange of data and data analyses

This level loosely characterizes the current level of cooperation, and will occur regardless of a formal agreement. Most agree that more complete and productive information could be obtained through a formal framework, e.g., through working groups that meet regularly.

### Level 2: Exchange of future plans

Although this practice does not occur to any great extent today, there appears to be merit in such a practice, to be exercised through bilateral working groups, for instance, in order to enhance communications, open doors for potential cooperative activity, and expose decisionmaking processes.

### Level 3: Exchange of Experiments on Missions

There is some activity currently underway in this area, for instance, the recent U.S.S.R. Vega mission contains two U.S. experiments.

### Level 4: Provision of Services

Providing national capabilities such as the Deep Space Tracking Network constitutes a mode of cooperation that may become increasingly important. Given the geographic separation, a reciprocal arrangement of this type could enhance satellite and ground system capabilities.

### Level 5: Educational and Scientific Manpower Exchange

Exchanges of personnel have come to a virtual stand-still since the expiration of the 1972 agreement. They are crucial linkage in cooperative exchange.

### Level 6: Joint Unmanned Missions

Cooperation on unmanned missions, particularly planetary probes, would present a compelling challenge not only in terms of potential cooperative achievements but also in the high degree of technical and administrative interface that would be required to carry out such a mission.

### Level 7: Joint Manned Missions

President Reagan's invitation to the Soviets to participate in a space rescue mission is still pending. Given the high degree of interfacing and collaboration, and in view of current political circumstances, this level would not appear to be attainable in the near future.

Descriptions of areas of potential cooperative activity follow:

### Unmanned Missions

#### International Geosphere Biosphere Program

##### Background

In 1984 the U.S. National Academy of Sciences proposed a program called the International Geosphere Biosphere Program (IGBP) which would focus on interdisciplinary research needed to address global environmental problems. To be successful, this requires international cooperation especially from countries such as the Soviet Union which possesses such large land masses. This research fundamentally involves global modeling and development of detailed data for input from ground-based and space-based instruments. Therefore, civilian utilization and involvement in remote sensing activities in the Soviet Union is practically non-existent.

The IGBP program was recently presented to the International Council of Scientific Unions (ICSU). A more detailed development of the program will be presented at the next ICSU meeting and at that time international support will be crucial.

##### Objectives

The objectives of this effort will be to gain Soviet support and involvement in the IGBP. Specifically:

- o remote sensing and related ground validation data should be obtained over the Soviet land masses;
- o coordination of future Soviet mission with U.S. mission such as the Upper Atmosphere Research Satellite should be obtained in order to optimize data return.

##### Initiative

The fundamental initiative should be to send a strong signal that the U.S. considers itself to be a participant in IGBP and other national participation is essential and in the mutual interest. Specific areas of mission cooperation and phasing will depend on Soviet intentions for future program approval.

## International Space Year

As sponsor of H.J. Res. 360, to express the sense of congress with respect to the designation of 1992 as "International Space Year," and for other purposes, Chairman Nelson probed the feelings of various Soviet officials concerning their sentiments on looking toward greater multilateral planning on space missions of an international character. An International Space Year was one item discussed with Academician Vladimir A. Kotelnikov, Chairman of Interkosmos during discussions at the U.S.S.R. Academy of Sciences. The Soviet official's reception to the idea was positive, and each side left determined to pursue such an initiative.

Upon the delegation's return, Chairman Nelson, as a member of the Conference Committee on the NASA Authorization for fiscal year 1986, proposed the inclusion of a modified form of H.J. Res. 360, in the Conference Report, (H.Rept. 99-379). As agreed to by both the House and Senate, the President shall submit to the Congress at the earliest practicable date, but not later than May 1, 1986, a report on any action taken with respect to the establishment in 1992 of an International Space Year. Such report shall include descriptions of possible international missions and related research and educational activities and such other activities as the President may deem appropriate.

In mandating the report requirement, it was the sense of the House and Senate that the year 1992 is ideally suited to the establishment of an International Space Year (ISY). The year 1992 marks the five hundredth anniversary of the discovery of America by Christopher Columbus. Spain will commemorate the discovery of America by launching an Hispanic communications satellite in 1992. Moreover, 1992 is the thirty-fifth anniversary of the International Geophysical Year (IGY), when the first artificial satellites were launched, thus marking the beginning of the space age. As a sequel to the IGY, an International Geosphere/Biosphere program is planned for the early 1990's, but its space activities will be limited to Earth observation. The conferees believe that space exploration has made enormous strides since the IGY and deserves concerted worldwide commemorative recognition and engagement. In addition to providing commemorative attention, the conferees believe that an International Space Year in 1992 could help maximize budgetary efficiency and scientific gain.

The purpose of the report is to urge the President to endorse the concept of an International Space Year for 1992 and consider the possibility of discussing the ISY with other foreign leaders including the Soviet Union. In addition, the Administrator of NASA in association with other relevant public and private agencies, should initiate inter-agency and international discussions that explore the opportunities for an ISY in 1992. Such discussions should address possible missions and research and educational activities of an international character, including the possible inclusion of current plans and programs into an ISY framework.

## Life Sciences

Background

Until 1982 the U.S. and U.S.S.R. enjoyed a high level of cooperation in the life sciences. Biological and physiological data on astronauts and cosmonauts was exchanged freely through special bilateral working groups. Human data was supplemented with other data on animals and plants to define zero gravity effects on full life cycles and effects at the cellular level. Since 1982 these working groups were formally disbanded. The Soviets collect a great deal of information on their cosmonauts while on orbit in their Space Station. Because of the time required for maneuvering and docking, no data is collected during the first one or two days following launch. Additionally, because their cosmonauts re-enter and land in remote locations, no data is collected for one or two days after re-entry. The Shuttle allows data collection during the initial and final stages but the duration on orbit does not compare with the Soviet data base.

Objectives

The objectives of this Initiative are common goals to both the U.S. and Soviet space programs. They are:

- o to fully define the mechanism for the adaptation to the zero-g environment;
- o to devise effective countermeasures to negate the adverse physiological effects of the weightless environment; and
- o to design regenerative life support systems that will enhance the viability of long duration missions.

Initiatives

In order to achieve these goals the following Initiatives could be undertaken:

- o Re-establishment of bilateral working groups -- although formal treaties may promote bilateral working groups, such agreements are not essential. Through such working groups physiological data can be jointly analyzed, experimental protocols can be mutually defined and one to one relationships can be established which will have long-term intellectual benefits.

BEST COPY AVAILABLE

- o Technology sharing -- the Soviets do not possess many capabilities for routine health monitoring that are available in the U.S. such as tomographic analysis. By providing such experimental hardware and software, as U.S. experiments, the Soviet data base will be more closely compatible with the U.S. data and the Soviets, in turn, will attain a higher quality experimental program. In addition, data on U.S. astronauts can be compared with Soviet cosmonauts and the initial and final phases of the adaptation mechanisms can be linked with the intermediate, long duration phase.
- o Joint biosatellite experiments -- through individual mission by mission agreements, U.S. and Soviet experiments can be jointly flown to collect data on plant and animal life. The U.S. can ensure that the Soviets can compete for space on such missions as the Long Duration Experimental Facility (LDEF). The data from such missions can be jointly analyzed and shared. Although, strictly speaking, such opportunities are already available to individual researchers such missions can be considerably enhanced by the addition of government-furnished capabilities such as JPL and other NASA centers.

BEST COPY AVAILABLE

## Lunar Orbiter

Background

Although the Soviet lunar program was de-emphasized during the 70's due to the clear superiority and success of the Apollo program, the Soviets are now planning for an orbiter mission to provide a great deal of detailed data on the geology, energy fields, and surface features of the moon. The current program provides for an orbiter to establish downlinks through direct telemetry. What will not be obtained through this plan is data on the far side of the moon. What would be required to solve this problem is an additional satellite stationed on the far side at a higher altitude to act as a repeater for data telemetry and to track the orbiter.

Objectives

The scientific objectives of this cooperative effort bear a close resemblance to those contained in the Solar System Exploration committee report which has established national priorities in solar system exploration. These are:

- o to map the gravity field characteristics of the moon (by precise tracking of the orbiter) and relate these to major surface features;
- o to obtain data on geochemical constituents through gamma ray spectroscopic analysis;
- o to obtain data on mineral characteristics through infrared spectroscopic analysis; and
- o assessment of global resources including frozen volatiles at the poles.

Initiatives

A cooperative initiative fundamentally relates to the provision of a second satellite. Two possibilities exist:

- o Mount a dedicated mission -- a U.S. lunar orbiter which would be placed in a favorable orbit could act to enhance the data return from a lower altitude orbiter provided by the Soviets and also return complementary data of its own;
- o move an ISTP craft to a favorable location -- NASA/Goddard is currently studying the potential for relocating one of the ISTP craft to the far side of the moon in a manner similar to the International Cometary Explorer. This would be relatively inexpensive.

BEST COPY AVAILABLE

## Mars Phobos Mission

Background

The Soviets now have an approved mission for launch in 1988 in which a spacecraft will land a package on Phobos, a Martian moon, and will collect data for at least one year on the Martian surface by remote sensing. The U.S. is now planning a similar mission called the Mars Orbiter which will use a spacecraft in polar orbit around Mars. The planned launch date for this mission is 1990. The two missions have common goals and could yield complementary data provided that the two can be properly phased. Flight opportunities occur roughly every two years.

Objectives

The objectives of this effort will be to collect both polar sun synchronous and equatorial data on the following:

- o elemental and mineralogical profiles;
- o time and spatial distribution for the sources and sinks of volatile materials and dust over a seasonal cycle;
- o the gravitational field and topography;
- o the atmospheric circulation characteristics; and
- o the planetary magnetic field.

In addition, this would be the first step in a long term cooperative program to explore Mars. A far term objective may be to mount a manned mission to Mars.

Initiatives

The objectives lend themselves well to a data exchange program as a minimum. Thus, the initiatives can be defined as:

- o data exchange from the two missions;
- o If the Phobos platform lasts long enough to overlap the orbiter, real time coordination and data exchange would be advantageous.

## Mars Sample Return

Background

A frequently mentioned candidate for U.S./Soviet cooperation is a Mars sample return. This is due to the mutual interest in Mars geology and the enormous expense of such a mission. Although such a mission has not been defined in much detail, generally it would require a heavy lift capability and the ability to collect and deposit samples from representative Martian sites.

Objectives

The science objectives of this effort would be to return representative samples of Martian soil to earth for detailed analysis of the type that cannot be automated. The primary motivations for international cooperation would be to defray the costs of such a mission and to establish one-to-one scientist relationships that would be of value for follow-on missions. By planning for a mobile rover incorporating a high level of artificial intelligence and robotics, such a mission could:

- o characterize the general landing area;
- o be dispatched to selectively sample specific geologically interesting areas.

Also such a mission would establish a working relationship between the two science communities that would be a necessary step if a future joint manned mission is to be undertaken.

Initiatives

The Initiatives that could be proposed are as follow:

- o the U.S. will develop and provide an automated rover vehicle with a sufficient level of robotics to recognize and retrieve representative samples;
- o the Soviets will develop and launch the spacecraft with a soft landing capability;
- o the U.S. will retrieve the return vehicle by means of the Space Shuttle or other appropriate Space Transportation System hardware.

## Radioastronomy

Background

Radioastronomy is the observation of stellar objects in the radio frequency wavelength. Such data are important in elucidating the nature of objects which are unique radio frequency emitters and in defining the mass/energy flow processes which take place. Radioastronomy telescopes, which are essentially dish-like antennas, are such that the information from different telescopes viewing the same object can be added together and the farther they are apart, the better the image. Space-based telescopes can be operated in conjunction with ground-based telescopes and other space-based telescopes to give extremely high quality images.

For the last several years, NASA, ESA, and the Soviet Union have been planning for a mission called QUASAT in which two satellites in different orbits would be coordinated with ground sites from many different countries. Under this planning agreement ESA would provide the spacecraft, the U.S. would provide the tracking and either the U.S. or ESA would develop the antennas. The Soviets would augment this network with another compatible satellite.

Recently, however, the Soviets announced that because of the U.S.'s delay in starting QUASAT, they were planning their own two-satellite system and they have solicited ESA cooperation. This may seriously impact U.S. plans for QUASAT if the cost of that mission cannot be shared with ESA. In addition, QUASAT may appear to be duplication of effort in light of the Soviet proposal.

Although the Soviet proposal is extremely ambitious, many U.S. scientists have reacted negatively to the Soviet decision to withdraw from previously anticipated levels of cooperation. However, in view of other astronomical missions now in planning, it is unlikely that resources can be diverted to this purpose at this time. Although the Soviet mission would clearly benefit from the transfer of U.S. technology, such as magnetic tape recorders, the value of reciprocal benefits from such cooperation would need to be carefully considered.

Comments

- o The phasing and initiation of the QUASAT mission necessarily depends on the schedule for the "Four Great Observatories". Delays in the Hubble Space Telescope were not fully anticipated due to technical difficulties, and these HST delays have had the effect of pushing back QUASAT.
- o QUASAT remains a high priority in the national program and the U.S. plans on proceeding with QUASAT.

## Remote Sensing

Background

**Earth Resources Satellites.** The Soviet Union gathers earth remote sensing data from its manned space stations and also from its Meteor-Priroda satellites. Its first earth resources satellite was launched in 1977, five years after the United States launched the first Landsat. Data from the Soviet satellites and space station are disseminated only in the Soviet bloc countries.

The Soviet Union, like every other country in the world, has been able to buy data from the United States Landsat system and will be able to continue buying from the United States commercial operator. The 1972 U.S.-U.S.S.R. agreement for cooperation in space, that lapsed in 1982, had led to a more specific agreement, approved in 1976, for increased cooperation in remote sensing. That specific agreement between the National Aeronautics and Space Administration and the Soviet Academy of Sciences provided for the exchange of supporting surface measurements and remote sensing data analysis through 1982. The data exchange, judging from congressional testimony, was successful, particularly for the U.S. Large Area Crop Inventory Experiment (LACIE).<sup>1</sup>

**Meteorological Satellites.** The Soviet Union operates polar orbiting weather satellites called Meteor, somewhat similar to the United States NOAA satellites. Typically they have two or three satellites in orbit at any one time. In 1979, the U.S.S.R. announced plans for a geostationary weather satellite, but it has not yet launched such a satellite.

The Soviet Union (along with many other countries) receives automatic picture transmissions (APT) and high resolution picture transmissions (HRPT) from U.S. NOAA satellites. The United States makes the signals available so that they can be displayed as images or converted into digital data. The U.S.S.R. contributes satellite and ground based weather observations to the World Meteorological Organization and has access to worldwide weather data, including data from U.S. civil polar orbiting and geostationary weather satellites.

Objectives

The objectives of a cooperative effort would be to gain increased access to Soviet satellite data and supporting surface measurements. Our ability to deal with weather phenomena on a global scale is growing,

---

<sup>1</sup>Whelan, Joseph G. "Soviet Attitude Toward International Cooperation in Space, Soviet Space Programs: 1976-1980, Part I." U.S. Senate. Committee on Commerce, Science, and Transportation. Committee Print, 97th Congress, Second Session, Washington, U.S. Government Printing Office, December 1982, p. 237-240.

meaning that we can better make long-range forecasts and better predict the general path of large storms, but this will also generate a need for better global data to feed our models. Therefore, with respect to weather satellite data our objective would be to make Soviet data as available as ours.

In other areas, data exchanges on a *quid pro quo* basis between related programs (e.g., similar radars) could increase the return from both programs.

#### Initiatives

The National Oceanic and Atmospheric Administration (NOAA), in the Department of Commerce, has met with the Soviet State Committee on Hydrometeorology and Control of the Environment (HYDROMET) to discuss the possible exchange of hurricane information and other data. NOAA is particularly interested in data from the side-looking radar (SLR) on Cosmos 1500 and 1602 satellites, which would be used in monitoring severe storms, ocean ice packs, and oil slicks. NOAA officials have indicated that they will probably proceed by suggesting specific, well-defined projects for the exchange of data. For example, the United States could provide airborne and surface data on severe oceans storms in exchange for Soviet Cosmos 1500 and 1602 data, with joint analysis and publication. In addition, there may be opportunities for NASA to exchange other data with the Soviet Union, such as photographs taken from the Space Shuttle for similar Soviet imagery.

## Solar Terrestrial Physics

Background

It is estimated that about 90 percent of the known mass in the universe is in the form of plasma -- an ionized gaseous state. Plasma behavior can be studied in comets and in the sun-earth environment. The Soviets excel and are intensely interested in studying plasmas as is evidenced by their desire to study cometary bodies. The U.S. has mounted a mission called the International Solar Terrestrial Program (ISTP) which will study the effects of the solar wind on the earth's outer atmosphere and magnetosphere. This mission will necessarily entail measurement platforms at a variety of locations relative to the sun-earth position. Other international partners include ESA (45% of the program costs, two spacecraft system) and Japan (5% of the program costs, one spacecraft). Through the various stages of the program development, the scientific content of the objectives have been reduced in scope in order to accommodate budget demands. NASA is currently proposing ISTP as a new start with launch dates in the 1991-1993 time frame to overlap with the NASA/ESA International Polar mission (Ulysses) and the Upper Atmosphere Research Satellite (UARS).

Objectives

The objectives of this Initiative are to enhance those goals already defined for the ISTP mission through the addition of additional measurement platforms flying in consort with the US/ESA/Japanese satellites. These goals are to define:

- o the transport of energy in the solar interior;
- o the dynamics of the solar corona and origin of the solar wind;
- o the coupling of solar wind energy into the earth's magnetosphere;
- o the global transport of energy and material within the magnetosphere; and
- o the deposition of plasma energy into the ionosphere and upper atmosphere.

By defining these objectives, especially the latter two, we can learn not only what influences many terrestrial phenomena but we can also study plasma physics for its own sake through experiments which cannot be performed on earth. This is likely to be attractive to Soviet scientists. The U.S. program would greatly benefit by enlarging the scientific scope of the mission and by measuring variables at locations not now planned.

BEST COPY AVAILABLE

Initiatives

The Soviets are well aware of the ISTP program and would likely welcome an opportunity to formally participate. The initiatives that would be most beneficial to the overall effort are as follows:

- o Additional instrumentation -- the existing program has been reduced in scope by the removal of spectrometers which measure energetic particles such as electrons and heavy ions. The Soviets have technologies which lend themselves well to developing such instruments. These could be mounted on Soviet platforms or perhaps could be provided for U.S., ESA, or Japanese spacecraft.
- o Additional locations -- currently the ISTP program does not provide for measurements at the L2 point (in the tail of the sun-earth plasma structure). Additional spacecraft here possessing instrumentation equivalent to that at the L1 point (the head of the plasma structure) would allow continuity in the data and would substantially help in developing a definitive theoretical model. The Soviet PROGNOZ series satellites are well suited to such a mission.

BEST COPY AVAILABLE

## Venus Radar Mapper

Background

The U.S. is now planning a core planetary mission called the Venus Radar Mapper which will be launched in April 1988. It will collect gravity field data, altimetry data, and will map greater than 70% of the surface of Venus at high resolution (one kilometer). Past Soviet probes and landers have provided a great deal of potentially useful information on the detailed nature of the Venusian surface.

Objectives

The objectives of this cooperative effort are to utilize the Soviet and U.S. data in much the same manner as ground truth and satellite data for earth observation. The Soviet data can provide a knowledge base that will increase our understanding of the nature of the planet. Specific objectives are:

- o to provide better interpretation of the gravity field and altimetry data; and
- o to correlate modes of radar roughness with known surface features.

Initiatives

The primary initiative is to provide for an equitable data exchange that would be mutually beneficial. This would involve the establishment of a working-group approach to data analysis and mission planning. The radar data generated could be provided to the Soviets for their follow-on missions. Currently the Soviets are planning a lander and/or atmospheric sampler mission called VESTA for a 1992 launch.

BEST COPY AVAILABLE

## Manned Missions

### Background

The previous pinnacle of U.S.-U.S.S.R. space cooperation was the Apollo Soyuz Test Project. Manned missions attract more attention and inherently contribute more than unmanned missions to one of the principal reasons for space cooperation, the generation of goodwill. Cooperative manned missions could be of several types: first, missions involving exchange or transfer of crew, for example a simulated rescue; second, jointly manned missions, that is, an integrated crew travelling to a planet; or, third, separately launched missions meeting in space. Any manned mission will have to be examined very carefully to make sure that both nations seem to have equal stature.

### Objectives

Specific mission objectives are discussed below. There are several general characteristics that are desirable for all joint manned missions. They should be:

- o Not "gimmicky"--would not merely make a political statement, but would serve a purpose that the general public would perceive as useful and productive.
- o Affordable--could be funded within the context of current NASA and overall federal budgets.
- o Equitable--would treat both nations as technological equals and not leave the impression to outside observers that one is superior to the other.
- o Technologically separable--would not result in the transfer of sensitive technologies to the Soviet Union (or vice versa).
- o Near term--could be accomplished within perhaps three to five years. In other words, we are seeking a good starting point with longer duration joint missions to follow thereafter.

### Specific Near-Term Mission Suggestions

- o Joint rescue demonstration--conduct a joint rescue mission involving a Space Shuttle and either a Soyuz spacecraft or the Salyut Space Station.
- o Shuttle/Salyut docking--conduct a rendezvous and docking between a Space Shuttle and the Salyut Space Station. (This could be billed as a precursor to U.S. Space Station missions.)
- o Flight crew exchange--train and fly a Soviet cosmonaut on a Space Shuttle and an American astronaut on a Soyuz. (Note, this could be done in combination with either of the other two missions mentioned above.)
- o Jointly manned mission to the Moon or Mars--this would require a high degree of coordination and mutual confidence.

## Mission Discussion

- Mission:** Flight crew exchange.
- Description:** NASA would train and fly a Soviet cosmonaut on a Space Shuttle and the Soviets would train and fly a U.S. astronaut on a Soyuz.
- Advantages:**
- o Is very inexpensive.
  - o Has high visibility.
  - o Could readily be done in the near term.
  - o Would involve little technology transfer.
- Disadvantages:**
- o The Soviets may gain (learn) more from this mission than the United States--the principal value to the U.S. is the insights the mission would give regarding Soviet flight hardware, operating procedures, and training programs and equipment.
  - o Somewhat "gimmicky".
- Discussion:**
- o Because the Soviets are developing their own version of the Space Shuttle, they may be quite interested in this mission to learn more about our Space Transportation System.
  - o The United States government will likely not be fundamentally opposed to allowing a Russian to fly on the Space Shuttle.
  - o The Soviets have flown astronauts from countries with close connections to the United States (i.e., France, and India), so they would probably not be fundamentally opposed to flying a U.S. astronaut.
  - o A flight crew exchange could be combined with either a rescue mission or a Shuttle/Salyut docking mission.

BEST COPY AVAILABLE

## Mission Discussion

- Mission:** Joint rescue demonstration.
- Description:** Existing space vehicles would be used to simulate the recovery of stranded astronauts. This could employ the U.S. Space Shuttle and either the Soviet Soyuz spacecraft or Salyut Space Station or both.
- Advantages:**
- o Purpose is worthwhile.
  - o Has high visibility.
  - o Is inexpensive.
  - o Could be done in the near term.
  - o Would involve minimal technology transfer.
- Disadvantages:**
- o May be perceived as lacking parity--with the rescuing nation having capabilities superior to those of the rescued.
- Discussion:**
- o Has been proposed to the Soviets by President Reagan.
  - o The Soviets have not formally responded to this proposal.

## Mission Discussion

Mission: Jointly manned mission to the Moon and Mars.

Discussion: Most observers with whom we have discussed these missions have been against pursuing them at this time. The problems are:

- o They are very expensive.
- o They are very far in the future.
- o They involve a high degree of technological risk.
- o They involve a high degree of political risk if one party backs out of the program, (the piece that would be left may not be viable as a stand-alone activity).
- o They may involve a risk of unacceptable technology transfer to the Soviet Union.

These observers believe that at this time it would be better to concentrate on joint unmanned precursor missions (orbital mappers, probes, sample return missions, etc.) that would have to precede the development of a lunar base or a manned flight to Mars.

On the other hand, proponents of initiating planning now for a joint manned mission to Mars agree that the mission would be preceded by unmanned precursors. However, they argue that jointly participating in a technically challenging, scientifically stimulating mission with a long-term horizon could bring our two nations closer together politically. The proponents also argue that we will eventually send men to Mars anyway, and by participating in this endeavor with other nations we will be able to conduct the mission more economically. Additionally, there have been some indications that the Soviets may be interested in pursuing such a mission.

## Mission Discussion

- Mission:** Shuttle/Salyut docking.
- Description:** This mission would bring together the two major elements of each country's manned space program. A transfer tunnel and docking collar would be carried by the Space Shuttle to execute a mating with the Salyut Space Station. The mission could possibly be used to test some operating concepts in preparation for U.S. Space Station activities.
- Advantages:**
- o Is only moderately expensive.
  - o Has high visibility.
  - o Could be done in the near term.
  - o Would involve minimal technology transfer.
- Disadvantages:**
- o Is somewhat "gimmicky".
  - o Would require the development of some new hardware (the docking adapter).
  - o May be perceived as lacking parity--the Soviets have a Space Station and we do not.
- Discussion:**
- o This mission was proposed by the United States in 1975 after the completion of ASTP.
  - o The Soviets were initially against it because they said that the Salyut did not have two docking ports (i.e., one for the Space Shuttle and one for the Soyuz that is used to return the Soviet crew to Earth).
  - o Current Salyut Space Stations do have two docking ports.
  - o If sensitive military equipment is on board the Salyut, it may be quite difficult for the Soviets to agree to this mission.

U.S. Embassy - Stockholm, Sweden  
Country Team Briefing

Date of Visit: Saturday, October 12, 1985

Location: U.S. Embassy, Stockholm, Sweden

The delegation was briefed at the U.S. Embassy by:

Mr. Franklin S. Forsberg, Ambassador  
 Mr. Sherrod B. McCall, Deputy Chief of Mission  
 Ms. Anne Pinckney, Economic Counselor  
 Mr. John Thomson, Public Affairs Counselor  
 Mr. Jack C. Daniels, Administrative Counselor  
 Mr. James May, Commercial Counselor  
 Col. Joseph Williams, Defense and Air Attache  
 Ints Stillins, Political Counselor

I.

Ambassador Forsberg opened the briefing with some background information about Sweden.

General

The Swedish government is currently controlled by the Social Democratic Party led by Prime Minister Olof Palme. The Social Democrats returned to power in 1982 after six years in opposition. The elevation of Palme to the post of Prime Minister stems from voter response to his campaign promise to reverse the economic stagnation associated with the years of non-socialist rule.

The country's low population growth rate 2 percent together with government retraining programs have kept unemployment rates at acceptable levels despite the large influx of immigrants into Sweden. Traditionally Sweden has encouraged immigration as a means of providing semi-skilled workers for industrial jobs. The integration of immigrants into the Swedish culture has been a more difficult process; there is some concern that the emergence of "ethnic pockets" in Sweden could result in future inter-racial and cross cultural friction.

Economy

Although Social Democrats currently control the government, privately held companies control 90 percent of Swedish industry. Industrial output accounts for 95 percent of the Swedish Gross National Product (GNP) with agriculture, fishing and forestry production making up the remaining 5 percent.

The country's industrial base is both diverse and technologically competitive with other major industrial economies such as those of Japan and the United States. Nevertheless, Sweden has lost export market shares due to a lack of international price competitiveness.

BEST COPY AVAILABLE

Real GNP growth has decelerated markedly over the last 5 years; Swedish Industrial production has lagged behind other OECD countries. Government expenditures have outstripped the rest of the economy as Sweden has attempted to maintain its social welfare expenditures. This has resulted in a rate of inflation in the 6-10 percent range over the last few years versus the government's target rate of 4 percent.

Exports account for two-thirds of the country's GNP. The United States is a leading importer of Swedish goods, second only to West Germany. Swedish exports to the United States are concentrated on automobiles, speciality steels and a wide range of electronic components and sub-systems used by U.S. firms in a variety of military and commercial applications.

The United States is presently running a trade deficit with Sweden. Steel manufacturers in the United States have been particularly vocal in their concern over the growing volume of speciality steel coming into the U.S. from Sweden and have lobbied Congress to place low import quotas on Swedish speciality steel. Sweden is opposed to such measures, arguing that its steel industry should not be penalized for making the substantial capital investments necessary to modernize and shift production away from bulk carbon steel in favor of higher margin speciality alloy steels.

There have been complaints by U.S. companies that certain Swedish markets are closed to U.S. products and services. The Swedish government has begun to "de-regulate" the telecommunications, banking, and insurance industries (partly in response to these complaints), making it easier for foreign competitors to have access to Swedish markets in these areas.

The Soviet Union receives one percent of Swedish exports. Although in principle the Swedish government supports expansion of trade with the Soviet Union, the larger companies in Sweden are reluctant for both political and economic reasons to expand the level of sales to the Soviet Union significantly.

#### Technology Transfer

The U.S. and Sweden enjoy a relationship of mutual cooperation and trust. Consequently when technology transfer issues do arise between the two countries they are generally quickly resolved. Sweden is very sensitive to U.S. concerns over the transfer of technology to the Soviet Union. The Swedish government has developed guidelines to control the export of high technology products to the Soviet Union. In addition, Sweden is exercising increased vigilance over high technology trans-shipped through Swedish ports which might ultimately find its way into the Soviet Union.

#### Military

Swedish military strategy and foreign policy are both based on the premise that national independence is best served by maintaining an

alliance-free policy in peacetime in order to remain neutral in the event of war.

Swedish military planning assumes that Sweden itself would not be the principal target of Warsaw Pact or NATO forces in the event of hostilities. However, there is serious concern that Sweden could be used as transit route by Soviet conventional forces enroute to NATO Nordic areas.

The relationship between Sweden and the Soviet Union has deteriorated over the last several years as a direct result of increased activity by Soviet submarines in and around Swedish ports. The continued incursion of Soviet submarines into Swedish territorial waters is perceived by many Swedes as a signal that the Soviets have claimed the Baltic as a Soviet "lake." Others allege that the Russians are practicing the landing of special military forces. The unifying theme of these ideas is that the Soviets may no longer be interested in maintaining Nordic political-military stability. Many Swedes perceive the Soviet Union to be the primary threat to Swedish sovereignty.

The cooperation between Sweden and the U.S. on military affairs is good given Sweden's military policy of non-alignment.

#### Swedish Space Activities

Sweden has a two percent membership interest in the European Space Agency (ESA). Swedish industrial "shareholders" in ESA include Saab, Volvo and Erikson. In addition, Sweden has developed the Esrange Launch Facility above the North Pole from which sounding rockets and weather balloons are launched. Presently the Swedes have cooperative arrangements with the Soviet Union, Japan, and the U.S. for conducting experiments using the Esrange Facility.

It appears that the Swedes might be ready to spend substantial resources on developing additional test ranges with the help of other countries interested in establishing cooperative agreements.

There are no major cooperative space activities between the U.S. and Sweden, other than those developed through U.S. cooperative agreements with the European Space Agency.

## II.

#### The 36th International Aeronautical Federal Congress (IAF)

From October 7-12, 1985, the 36th International Astronautical Federation (I.A.F.) Congress was hosted in Stockholm, Sweden by the Swedish Society of Aeronautics and Astronautics. Sweden was one of the eight countries that founded the I.A.F. in 1950; in 1960 the Society hosted the 11th I.A.F. Congress in Stockholm. Although the short layover time in Stockholm precluded the Nelson Congressional Delegation from attending the Congress, embassy officials provided a brief overview of the Congress along with conference materials.

The International Astronautical Federation is a non-governmental association of national societies and institutions. Founded in 1950, the I.A.F. today has 63 members in 35 countries. The goals of the I.A.F. are: to foster the development of astronautics for peaceful purposes; to encourage the wide-spread dissemination of technical information; to stimulate public interest in space flight through the major media of mass communication; to encourage astronautical research; to convene congresses and scientific meetings; and to cooperate with other organizations in all aspects of natural, engineering and social sciences related to astronautics and the peaceful uses of outer space.

In 1960 the I.A.F. created the International Academy of Astronautics (IAA) and the International Institute of Space Law (IISL) which cooperated closely with the Federation.

The Federation organizes an International Astronautical Congress every year in a different country. The program of the Congress is devoted to the progress achieved in different fields of astronautics. Proceedings of the congresses are published regularly.

The theme of this year's Congress was: "Peaceful Space and Global Problems of Mankind." During the course of the Congress, approximately 500 papers were presented. The Soviets were scheduled to present 65 papers, but only presented a total of two. In all, there were over 1,000 participants in this year's I.A.F. Congress.

U.S. Embassy - Moscow, U.S.S.R.  
Country Team Briefing

Date of Visit: Sunday, October 13, 1985

Location: U.S. Ambassador's residence - Moscow

The delegation was briefed on a wide range of domestic and international issues which directly or indirectly affect U.S.-U.S.S.R. relations.

Soviet Political Situation

The rapid rise to power of General Secretary Gorbachev marks the beginning of a new era of the Soviet Union and for United States and Soviet relations. Gorbachev's consolidation of power, achieved in part through the elevation within the party of younger political leaders loyal to Gorbachev, reinforces the important fact that ill-health among Soviet leaders will no longer be a key factor affecting the pace of the country's management or the continuity in U.S.-U.S.S.R. relations.

Gorbachev is uniquely positioned to take advantage of the next Party Congress in February, 1986. Between now and then he will be working to replace key central and regional managers with people loyal to him, thereby guaranteeing his dominance over the new party program.

Gorbachev did not rise to power via the "traditional" channels. After attending law school in Moscow, Gorbachev returned to his home district where he participated in district politics for 20 years. Gorbachev's background in local politics is likely to give him a sharper understanding of the problems that the Soviet economy is having and the impact of these problems on other aspects of Soviet life. Consequently, Gorbachev is likely to focus his attention on the Soviet Union's domestic problems while favoring a less confrontational stance toward the west.

Soviet Economy

The Soviet Union is about to embark on another five year plan. Although this plan is likely to provide for an allocation of resources between military and civilian programs along the lines of previous plans, the actual performance of the non-military economy has historically lagged below planned targets.

In the 1970's economic growth fell below four percent. In the 1980's, economic growth has been two to three percent. Although this decline can be explained partially as a natural slow down, it is also the result of a decrease in productivity arising from worker alienation.

Worker alienation is a significant problem in the Soviet Union. Widespread alcoholism, tardiness, and absenteeism are significant problems in the Soviet Union. This situation is exacerbated by chronic shortages

of consumer goods and inadequate housing. These living conditions have contributed to a declining birth rate over the last 20 years which, in turn, has resulted in a shrinking pool of skilled labor.

Alcoholism among men has reached such proportions that it is suspected to be the main cause in a higher than normal death rate of Soviet males age 17-35. In an attempt to reverse this trend, Gorbachev has instituted policies to curtail significantly the consumption of alcohol among workers. In this manner he hopes to increase worker productivity, thereby stimulating the economy. However, alcoholism is symptomatic of deeper and broader social and economic problems within the Soviet Union. It is the root causes of these problems which must be addressed by Gorbachev.

The reluctance of the Soviet leadership to undertake radical social or economic reform is understandable, given the impact that such change would likely have on the strength of the Communist Party. For this reason, any reforms instituted by Gorbachev would, in all likelihood, be aimed at changing behavior of the Soviet people to make the "process" itself more efficient, rather than changing any of the ideological elements of the communist doctrine.

#### U.S.-Soviet Relations

The focal point of United States and Soviet relations centers on the nuclear and space arms negotiations presently being held in Geneva. Central to these discussions is Soviet concern over the US Strategic Defense Initiative (SDI). The Congressional Delegation was advised it would encounter the SDI issue in any discussion on the topic of space cooperation.

The Soviets have declared that the Geneva negotiations can not move forward until the SDI issue has been satisfactorily resolved. Nevertheless, following discussions between President Reagan and Foreign Minister Shevardnadze in late September, the Soviets tabled a detailed counter-proposal at the Geneva talks. Although this counterproposal contains little that is attractive to negotiators for the United States, it does represent a baseline from which serious discussions can begin.

With respect to the issue of Human Rights, the signing of the Helsinki agreements in 1975 by both the United States and the Soviet Union has helped to elevate human rights as a central issue in U.S.-U.S.S.R. relations. The ideological gap that exists between the two countries relative to human rights issues was covered and the delegation was advised not to expect a substantive dialogue on the subject of human rights, should the topic come up during the discussions.

U.S.-U.S.S.R. Cooperation In Space

The progress made in the Geneva arms negotiations and the outcome of the Reagan/Gorbachev summit meeting will largely dictate the direction and intensity of future U.S.-U.S.S.R. cooperative efforts in space. The Soviets do feel that cooperation with the United States in space reflects the importance of their space program and that cooperative space projects are worth pursuing. Obviously the advantages of sharing technical data as well as the cost of expensive space projects are also factors which make the topic of cooperation in space worth discussing.

Presently there is a reasonable amount of U.S.-U.S.S.R. scientist-to-scientist cooperation occurring on various space projects. Cooperation typically involves the sharing of research and experimental data among scientists. However, since the expiration in 1982 of the last U.S.-U.S.S.R. cooperative agreement, no new space agreement has been negotiated between the two governments. The likelihood that a formal cooperative space agreement will be negotiated in the future depends on the evolution of U.S.-U.S.S.R. relations in a much broader context.

The willingness of the United States to participate in future cooperative space projects with the Soviets should directly reflect the level of benefits this country receives from such projects. Given this measurement, the delegation was encouraged to discuss with the Soviets all potential avenues of peaceful space cooperation, including those areas requiring less formal arrangements.

BEST COPY AVAILABLE

Economic Achievement Center

Date of Visit: October 13, 1985

Location: Moscow, U.S.S.R.

The delegation was given a tour of the Exhibition of Economic Achievement of the U.S.S.R. on Sunday, October 13. The exhibit is built on a grandiose scale beginning at the entrance where a 300 foot monument made of titanium-covered steel symbolizing a rocket blast-off greets entering visitors. The park itself is composed of exhibits commemorating Soviet achievements in agriculture, science and technology, space, and the 15 Republics. There are nearly 300 pavilions in the park.

The delegation visited two pavilions--Science and Technology and Space ("Cosmos"). In the Science and Technology pavilion, the delegation saw exhibits that included industrial machinery (such as milling and stamping machinery), holograms, units to grow crystals, and a model of a fusion generator (similar to Tokamak in Princeton, New Jersey). Models of the Venera spacecraft that is on its way to Halley's Comet and the Venus Probe were also on display at the Science and Technology pavilion.

The real interest of the delegation at this activity was the Cosmos exhibit, which houses exhibits related to the Soviet space program. This exhibit is composed of two buildings--one for manned flight and one for unmanned flight. In this popular exhibition hall, there were three models of the Soyuz communication satellites, a model of the COSPAS satellite, a Sputnik suspended from the ceiling and a Salyut space station module.

One wall of the pavilion paid tribute to the Cosmonauts with photographs of each, including the American ASTP astronauts, Donald K. (Deke) Slayton and General Thomas Stefford, who accompanied the delegation. Some of the Soviet children visiting the exhibit recognized General Stefford.

The delegation was also informed that the Vega is the last of the Venera class of rockets and that Phobos is the new generation of Soviet spacecraft.

The Economic Achievement Center is designed to exhibit Soviet national achievements, talents, and strengths. The visit did not involve policy-oriented discussions.

### Mission Control Center

Date of Visit: October 14, 1985

Location: Kaliningrad, U.S.S.R.

On Monday morning, October 14, 1985, the delegation visited the Mission Control Center that manages Soviet manned spaceflights. The facility is located at Kaliningrad, about 20 kilometers northeast of Moscow. This facility is rarely open to visitors from the west. The last Americans to be there visited in conjunction with the Apollo-Soyuz Test Project (ASTP) mission in 1975.

The delegation was warmly greeted by the Director, Yourly Majorin, and his staff. The other Soviet officials who were present included:

- o Vladimir Lobachev - Manager of the Center
- o Valentin Belokuzov - Deputy Manager of the Center
- o Valeri Rumin - Flight Director
- o Aleksey Yeliseev - Director of the Salyut Program
- o Valeriy Kubasov - ASTP Cosmonaut
- o Stepan Bogodjash - Public Relations Officer.

The delegation was taken to a large, well appointed conference room and briefed on the current activities of the Mission Control Center. At the present time, these activities focus on supporting the Salyut space station and its crews, but the Mission Control Center officials indicated that they are also currently controlling two Vega missions, three unmanned missions, and several astronomical satellites.

In response to questions raised by Members of the delegation, the Soviet officials also made the following points:

- The solar panels on the Space Station (which have just been expanded in area) are roughly half gallium arsenide and half silicon, and generate 5 KW of power.
- Although a crew of six is possible, there are usually only three on board the Space Station at any one time.
- COSMOS 1686 is similar to COSMOS 1443 except that 1686 has more fuel and supply space but cannot be used as a return vehicle.
- The Soviets have two female cosmonauts with six more in training.

Following the briefing, members of the delegation were permitted to ask questions. In response to the key question of the possibility for future U.S.-U.S.S.R. cooperation on manned spaceflight missions, the Director of the Mission Control Center indicated that they are merely an operating center and that this question would have to be directed to other officials such as those at the U.S.S.R. Academy of Sciences.

Next, the delegation was taken on a tour of the facilities. First, the group was shown the small control room that had been used to manage the ASTP mission in 1975. Though this room has been preserved, it appears that it is no longer in use.

The delegation was then taken to the main mission control room. This facility is large (perhaps larger than its counterpart at the Johnson Space Center) with modern video displays of orbital tracks, spacecraft position, time and technical data, the mission schedule for the day, and TV transmissions from Salyut. The facility also has a spacious, plush viewing balcony for VIPs. It was particularly interesting to note from the number of consoles on the floor of the control room (apparently about one quarter to one-third of those in a Space Shuttle control room) that the Soviets are apparently able to monitor and control the Salyut space station and its crews with much fewer personnel than NASA uses to support Space Shuttle missions. This probably reflects the less complex nature of their flight equipment.

While the delegation was in the control room, the Salyut space station came within range of tracking stations within the Soviet Union. As soon as Salyut came within range, a live television transmission from the Salyut crew appeared on one of the large video screens in the control room. The picture was of fairly high quality and showed the three Salyut cosmonauts positioned side by side facing the TV camera. At that point, the Soviet officials offered members of the delegation an opportunity to converse with the Salyut crew. In fact, the Soviets devoted the entire 10 to 15 minutes that the Salyut was in view of ground-based receiving stations to telephone conversations between members of the delegation and the Salyut crew.

After completing the telephone conversations with the Salyut crew, the delegation was shown a movie which described and commemorated the ASTP mission. This film appeared on the same control room screen that earlier had been used to display the video transmissions from Salyut. The delegation was then taken from the VIP viewing area to the floor of the control room. There we were shown the control room panels and met with the technicians that operate them. Several of these technicians had been involved with the ASTP mission and were clearly very happy to again see two of the American astronauts from that mission.

Before leaving the facility, each member of the delegation was presented with a medal that symbolizes the space activities of the control center. Program officials described the medal as very rare. After presenting the gifts from our delegation, Mr. Nelson extended an invitation for the Soviet officials to visit the Johnson Space Center in Houston, Texas. Mr. Nelson also mentioned that while he is in orbit in the Space Shuttle he would again like to speak with the cosmonauts onboard Salyut. The Soviet officials said they would see if this could be arranged.

BEST COPY AVAILABLE

Institute for Bioorganic Chemistry

Date of Visit: October 13, 1985

Location: Moscow, U.S.S.R.

The Institute for Bioorganic Chemistry is one of the newest of the Soviet Institutes dealing with biotechnology and its application to contemporary economic, technological, and health related problems. The Institute has a staff of 5,000 of which 25 percent, or 1,200, are senior scientists. The Institute is housed in a series of interlocking buildings (designed to reflect the double helix structure of the DNA molecule) which cost over \$100 million. Differential building pressures are maintained in order to enable safe research with human viral strains and other hazardous substances. The Institute is directed by

Y. Ovchinnikov, a prominent member of the Soviet Academy of Sciences and one of its Vice Presidents.

The Institute performs both basic and applied research in three areas: genetics, bioengineering, and transport across membranes. The Institute has set for itself several ambitious goals related to national needs. The Director stated that the Institute's work would result in the production of over 1.5 million tons of protein through single cell bioproduction. The importance of this goal stems from the generally poor state of Soviet agricultural productivity. The climate in the Soviet Union cannot support the growth of such protein staple crops as soybeans. The Institute also performs research on single-cell protein production in order to enhance the mixed feed industry. Currently this work involves a petroleum substrate although a major objective is the development of a natural gas substrate.

Other major program goals include the establishment of pilot plants for other medically important proteins and enzymes such as Interferon and human Insulin. Specific mention was made of gamma and Immune Interferons and the behavior of lymphocytes.

It was inferred that this research may eventually be applied to the cure of AIDS. Based on the observation of AIDS in various segments of society, it was suggested by the director that this syndrome may pose a general threat to any population although he asserted that no cases of AIDS have been documented in the Soviet Union.

With regard to the application of space-based experiments, no research has as yet been carried out by the Institute although this was characterized as clearly desirable. Interest was expressed in the effects of microgravity on cell fusion processes. The Institute apparently has future plans for performing such microgravity experiments, however, flight opportunities have not yet been available. Notwithstanding the influence and importance of this Institute in the area of biotechnology, cross fertilization, interdisciplinary research, and application research have not been easily addressed.

The Institute has recently signaled its intentions to establish collaborative research programs with various scientists of the United States. This cooperation would be carried out under the aegis of an exchange agreement between the Soviet Academy of Sciences and the U.S. National Academy of Sciences. Areas of such cooperation include research on membrane transport phenomena, protein chemistry, and genetics. Although some progress was made during a visit to the United States in early 1985, no clear agreements have yet been reached. In addition, it was pointed out that stronger links between the Institute and the Soviet academic community have been sought.

During a tour of the facility, it was clear that emphasis had been placed on modern technologies, and much of the analytical equipment appeared to be Western-made. Thus the Institute has apparently been considered important enough to fund its development with sufficient hard currency that would allow substantial purchases of foreign hardware. The Institute clearly compares well to any counterpart in the United States.

With regard to future cooperative efforts, a potential exists to involve the Institute in space applications if an agreement can be achieved between the National Academy of Sciences and the Soviet Academy of Science. Programs involving a space platform, including the Space Shuttle, would be carried out by joint U.S.-U.S.S.R. teams with a high degree of reciprocity and data sharing.

### Institute for Space Research

Date of Visit: October 13, 1985

Location: Moscow, U.S.S.R.

The Space Research Institute (IKI) is the principal Soviet research facility responsible for the planning and development of civil space programs. The trip to the Institute was a major focal point of the delegation's visit to the Soviet Union. This visit was preceded by an earlier meeting in the United States between the Subcommittee Chairman, Mr. Nelson, and the Director of the Institute, Dr. Roald Sagdeev. The Institute employs about 1500 scientists and coordinates the formulation of major mission goals with the Academy of Sciences and all cooperative efforts with Intercosmos.

The delegation's visit to IKI occurred at a significant and unique time with respect to U.S.-Soviet cooperation in space. Despite the lapse of an intergovernmental agreement, a significant degree of cooperation is nevertheless taking place between the U.S. science community and the Institute. The Soviet Vega mission includes U.S. participation at the individual scientist level. In addition, the NASA deep space tracking network will be crucial in retargeting spacecraft to intersect the Halley's cometery tail with greater precision. Scientists from the United States will be able to share freely in the data during the encounter and afterward. The nature of the Vega mission cooperation together with the general tone of the discussion suggested a strong desire for continued collaboration on individual projects.

Dr. Sagdeev outlined the following major initiatives for the Institute:

- o In mid 1988 the Soviets will launch a mission to Phobos which will provide data on the Phobos landing site and on Mars by remote sensing. The Phobos mission will collect a great deal of data complementary to that of the previous Viking mission. The mission will use their next generation of unmanned deep space satellites.
- o In the area of astronomy, a recently approved mission to launch two radio telescope dishes in high energy elliptical orbits will provide a very long baseline array in which both ground and space platforms can be correlated. Currently two ground based 70 meter dishes exist in Ukraine and Middle Asia and a third is being planned.
- o Another mission now under development called GRANAT will provide a high energy x-ray astronomical platform. This telescope will be launched in 1988 and may substantially precede the U.S. AXAF deployment. A precursor to the GRANAT telescope is now being flown on the Salyut space station. The Salyut station has also recently added a Czechoslovak-built furnace to study crystal growth, alloys, and glasses.
- o Finally, the Soviets also have in development a mission similar to the Cosmic Ray Background Explorer in which detailed all-sky mapping in the millimeter wavelength region will be accomplished. Temperature differences of 10 microdegrees may be detected and the

distribution or background radiation would be well characterized if the technical goals are met.

During the course of the discussions, the U.S. delegation mentioned several cooperative efforts of potential interest to the Space Research Institute. The joint exploration of Mars could proceed from a data sharing program from the Phobos and the U.S. Mars Observer missions, to a joint mission for a Mars sample return, and finally to a joint manned mission to Mars. The delegation also discussed a potential joint effort with regard to solar terrestrial research in which the Soviets would provide an additional spacecraft to complement the current International Solar Terrestrial Physics program. Similarly, the delegation discussed the possibility that the United States might consider providing an additional satellite to complement the Soviet Lunar Orbiter in which this second satellite would provide telemetry and tracking data from the far side of the Moon. Mention was also made of a possible joint data sharing effort for the U.S. Venus Radar Mapper mission and various Soviet Venus missions. Finally, the delegation pointed out the current Soviet radioastronomy mission could be more closely coordinated with the U.S. Quasat mission.

Generally, the Soviets were very receptive to these potential cooperative programs. Dr. Sagdeev pointed out, however, that data sharing was already a policy of the Space Research Institute and this would be done even without a formal agreement. Conversely, for major joint missions, he implied that a formal agreement would be necessary. In the meantime, he recommended that both the United States and Soviet Union continue their involvement in various multilateral organizations such as the Interagency Consultative Group (IACG).

It is significant that, in program planning, the Institute selects areas of emphasis which are different from the United States' approved program objectives yet derived from a fundamentally similar overall strategy for planetary exploration and observations of the universe. The result of this is that Soviet programs frequently address areas that are in a mature state of planning but not yet approved as new starts in the NASA budget. Although this has the potential to diminish the science merit of many United States missions, it also offers a constructive challenge and the possibility of cooperation which may be of benefit both financially and technically.

### U.S.S.R. Academy of Sciences

Date of Visit: October 14, 1985

Location: Moscow, U.S.S.R.

#### Background

The U.S.S.R. Academy of Sciences, the oldest and most prestigious scientific establishment of the Soviet Union, was founded in 1724 by Peter the Great and has played a dominant role in scientific research up to the present time. The Academy employs 51,000 scientific personnel including 4,461 Ph.D.-equivalents.

The President of the society is Academician Anatolily P. Aleksandrov who was not able to attend our meeting. First Vice President Academician Vladimir A. Kotelnikov chaired our meeting. Also present at the meeting and contributing significantly was Vice President Yevgeniy Pavlovich Veilkhov and Academician Oleg G. Gazenko who is Director of the Institute for Biomedical Problems. Another Vice President of the Academy not present at our meeting is Y. Ovchinnikov, Director of the Institute for Organic Biochemistry which the delegation had visited the day before.

A complete list of Soviet attendees is given at the end of this section.

The official governing authority of the Academy is its General Assembly which through the seventeen departments of the Academy directs the work of some 250 research institutes. However, the principal policy making body appears to be the presidium of the Academy comprised of elected Academy officials and certain leading scientists.

The Academy research program encompasses virtually all areas of science. The departments most relevant to space research are: general physics and astronomy; geology, geophysics and geochemistry; information science, computer technology and automation; mechanics and control processes; nuclear physics; oceanology, atmospheric physics and geography; and physiology.

The Academy identifies the most important problems in the natural and social sciences and formulates annual and long-range plans for research on these problems. It allocates resources in support of these research programs in cooperation with the State Committee for Science and Technology. The Academy ~~per se~~ is composed of 256 full Academicians with 524 corresponding members. Election to membership in the Academy--the highest honor a Soviet scientist can achieve--is by secret ballot in the General Assembly. Nominees must receive two-thirds of the votes of the Academicians. Currently at least 72 percent of the Academicians are Communist Party members.

A constituent part of the Academy is the Intercosmos Council. The Council does not conduct research but is a secretariat organization responsible for coordinating the Soviet international cooperative space activities and participating in international space law activities such as meetings of the U.N. Committee on the Peaceful Uses of Outer Space (COPUOS). Its formal name is "The Council for International Cooperation in the Exploration and Uses of Outer Space." The Chairman of

Interkosmos is Academician Kotelnikov. Two of its three Deputy Chairmen, G. Balayan and V. Vereshchetin, were present at our meeting.

The largest program of Soviet international space cooperation is carried out with its socialist allies in Eastern Europe. In addition, the U.S.S.R. is cooperating in space research on a bilateral basis with a number of western countries. The largest joint programs are with France, India, Sweden, the United States, and recently the European Space Agency.

The U.S.S.R. Academy of Sciences has a much larger role in the formulation and execution of science policy for the Soviet Union than does its counterpart in the United States, the National Academy of Sciences. The Soviet Academy and the U.S. Academy are both honorary institutions recognizing individual contributions, but the Soviet organization is much more directly and officially involved in the governance of its nation's science activities.

#### Meeting

The delegation's meeting with the Academy was much more formal than other site visits. For example, the Soviet delegation sat all on one side of a long table and the U.S. delegation was on the other side, with each leader in the center behind a flag. The discussions themselves were more formal and certainly less technical than those at other site visits.

The meeting was opened with a general welcome and introduction of the Soviet side by Academician Kotelnikov. He mentioned three agenda items for the discussion: science in general, space research, and the workings of the U.S.S.R. Supreme Soviet in the governance of science. In any event, the delegation discussed only the second of these, space research.

Mr. Nelson made a general statement thanking the Academy for its hospitality and introducing the U.S. attendees. Mr. Nelson made the point that the delegation was in the Soviet Union to discuss the possibility of cooperation in space.

The U.S. delegation raised the possibility of exchanging data resulting from the Soviet Phobos Mission and the U.S. Mars Observer Mission. The Soviets said that this would seem to pose no problem; however, when they were pushed harder as to whether the data could be exchanged in 1988 there was a somewhat evasive answer. In other words, they would not commit to give the United States data from their mission before our mission launched.

The U.S. delegation raised the possibility of an unmanned mission to Mars involving a rover delivered by one nation and the return of samples by the other nation. The Soviets were very cautious in responding. They pointed out that such a project would be very difficult and that they had not had time to think about it.

There followed a general discussion of cooperation, in particular, that there is cooperation underway right now in spite of the absence of a formal agreement governing such cooperation between the two countries. At this point the question was raised by the American side as to whether there was a possibility that a formal agreement for space cooperation would be on the agenda of the upcoming Summit meetings. The Soviets were very cautious in their answer but indicated that there was indeed a possibility that this would be on the agenda. Apparently this was a late development, because before leaving the United States the delegation had been advised that it would not be on the agenda.

There was discussion of the current situation in which there is informal sharing of data. The Soviets indicated a desire to regularize such procedures in order to have more current exchanges. The establishment of working-groups was suggested.

The Soviets then raised the question of why some cooperative agreements, for example, the one covering research on thermonuclear fusion, have been allowed to continue while others, such as the agreement on space cooperation, have been terminated. This question was not adequately resolved.

There was also discussion of the fact that scientists from the Soviet Academy have met with scientists representing the U.S. National Academy of Sciences to discuss disarmament and arms control. These groups of scientists have reached various agreements or understandings and the Soviets asked why these understandings had not been reflected in U.S. official policy. This was not satisfactorily resolved. The U.S. side did make the point that the U.S. Academy is not an agency of the U.S. Government.

At this point the Soviets raised their objections to the U.S. Strategic Defense Initiative. The American delegation answered these objections and it was agreed that this was not an agenda item and that the meeting should move on to other items on the agenda. The American delegation raised the question of human rights, pointing out that several Soviet Academicians seemed to be receiving very poor treatment from Soviet authorities. The Soviets responded that there are laws in the Soviet Union governing actions of all citizens. These laws are effective whether the person concerned is a scholar, investment employee, farmer or whatever. The enforcement of these laws is the duty of other ministries and questions about that should not be addressed to the Academy.

The American delegation raised the subject of radio astronomy and in particular, the recent Soviet decision to go ahead alone with their program which apparently will not be compatible with U.S. ideas. The Soviets indicated that they have not completed their designs and that they remain open to the possibility of cooperation with the United States. In this area they feel a formal agreement would be very imprudent.

The American delegation discussed the joint resolution which has been introduced in the U.S. Congress to organize an International Space Year. Members of the U.S. delegation offered to advance this legislation in the Congress. The Soviet side offered to take similar actions on their side.

The American delegation raised the International Solar Terrestrial Physics program and inquired as to whether or not the Soviet Union was interested in participating. The Soviets said that they had not received a formal invitation and planned to be merely observers but probably would be interested if they did receive such an invitation.

The U.S. delegation raised the subject of the Soviet Lunar Orbiter which is planned for development and asked whether the Soviets would be receptive to enhancing that mission by adding an orbiting U.S. satellite to provide coverage on the far side of the Moon. The Soviet answer was somewhat evasive and cautious but they did indicate possible receptivity.

The American delegation raised the subject of a simulated space rescue mission to demonstrate joint capabilities. The Soviets pointed out that such a rescue project had been brought to the attention of the Soviet government and that an answer had been made through other channels.

At this point several members of the U.S. delegation spoke about the general value of cooperation. After this the meeting adjourned and Academician Kofelnikov invited the delegation to attend a ceremonial luncheon.

List of Soviet Attendees

Academician V. A. Kotelnikov  
First Vice President  
Member of the Supreme Soviet  
President of the "Intercosmos" Counsel

Academician E. P. Velikhov  
Vice President  
Member of the Supreme Soviet

Academician O. G. Gazenko  
Director of the Institute of Medical  
Biological Problems

Academician B. V. Raushen Cakh  
Moscow Physical Technical Institute

Dr. V. S. Vereschetin  
Vice President of Intercosmos  
Vice-Director of the Institute of  
State and Law

Dr. G. S. Balayan  
Vice President of Intercosmos

Dr. A. A. Kokoshin  
Vice Director of Institute of USA  
and Canada Studies

Y. V. Stazostin  
Member of Intercosmos

Dr. V. K. Dobroselskiy  
Chief, Foreign Relations  
Department, Academy of Sciences of the U.S.S.R.

Mr. N. I. Belyaev  
Deputy Chief  
Foreign Relations Department

Mr. N. V. Belousov  
Deputy Chief  
Foreign Relations Department

Mr. V. A. Stepancov  
Chief Adviser  
Section on U.S.A. and Canada  
Foreign Relations Department

Mr. Yu K. Shigan  
Senior Adviser  
Section on U.S.A. and Canada  
Foreign Relations Department

Institute for Biomedical Problems

Date of Visit: October 14, 1985

Location: Moscow, U.S.S.R.

Perhaps the longest and most successful area of cooperation in space between the United States and the Soviet Union has been in the life sciences field. The exchange and analysis of data has taken place both with and without intergovernmental agreements.

The Institute of Biomedical Problems is the focal point for research on the effects of the microgravity environment on life systems. The philosophy of the Institute research is distinctly interdisciplinary. The nature of the problems addressed requires physicists, chemists, mathematicians, biologists as well as medical and social scientists. The objectives of the Institute include the development of optimum work/rest cycles, entertainment requirements, selection and training criteria for cosmonauts, and the provision of medical support for cosmonauts. Underlying these objectives, the Institute is responsible for addressing long term challenges to man in space such as readaptation, regenerative life support systems, and establishment of acceptable health standards (e.g., radiation).

The history of cooperation between the Institute and various counterparts of the United States spans two decades. A key element in this cooperative program which is regarded by both the United States and Soviet Union as essential was the establishment of joint working groups. These working groups have met informally to lay out mutual program objectives, define experimental protocol and to analyze data. In addition, several biosatellites have been flown carrying joint U.S.-U.S.S.R. experiments. During the delegation's visit it was pointed out that several scientists from the NASA Ames Research Center were in residence to complete data analysis from a previous project.

An extensive tour of the Institute's facilities demonstrated the breadth of involvement in various practical problems related to space flight. A treadmill apparatus was shown in which the cosmonauts exercise up to two hours a day. For long duration flights more extensive measures must be taken. It was significant that the stated goal of their protocol is to prevent adaptation to space. The need for salt and water loading was also discussed and was clearly a necessity in both the United States and Soviet programs. One conspicuous difference between the United States and Soviet programs was the relative lack of emphasis by the Soviets on the initial adaptation syndrome and the incidence of space sickness. Thus, it was explained, is due to the Soviet mission profile in which the cosmonauts are not expected to begin performing essential tasks until after the three or four days required to adapt. It was stated that about 50 percent of the cosmonauts experience space sickness during the first few days.

Progress on water and air regeneration has been slow. Currently the Soviets state that they are able to recover and reuse about 1/3 of the water needed.

BEST COPY AVAILABLE

The Soviets have explicitly considered the need for radiation protection and dosimetry. Radiation doses in tissue equivalent samples and dose rates are evidently measured routinely aboard the Salyut Space Station. In the event of a major solar flare, the cosmonauts have an option to return to earth via an exit vehicle. The Soviets have given special consideration to the biological effects of high Z particles which produce a disproportionate level of damage through secondary effects.

The delegation was shown an ongoing experiment particularly relevant to the psychological effects of long duration flight. The Soviets maintain a closed habitat in which three subjects have lived for almost a year. The subjects are remotely observed at all times by specialists from the Institute. Clearly the Soviets have had the opportunity and the need to take much more detailed account of subtle human factor effects on crew coordination and performance than has the United States.

The delegation was also shown the portable field facility which provides immediate medical services to cosmonauts at the site of landing. These facilities also collect immediate data on cosmonauts and bio-satellite packages soon after reentry.

The delegation was favorably impressed with the diversity of experiments in progress at the Institute. Plant and flower germination experiments and primate neurological studies were clearly in a very mature state.

During discussions the delegation inquired as to the Institute's planning for life support during long duration missions such as to Mars. Institute personnel were generally reserved as to the immediate potential for such missions due to the weight requirements for water and the lack of any obvious support augmentation systems such as plants. The Institute does not believe that artificial gravity would be necessary for a Mars mission.

The delegation proposed that closer cooperative efforts be reestablished through whatever mechanisms are available. Mr. Nelson offered to share the results of any physiological experiments performed during his December Shuttle flight. The Institute was very receptive to all of these proposals and expressed a mutual interest in reviewing the working group relationships.

### Star City

Date of Visit: October 16, 1985

Location: Outside Moscow, U.S.S.R.

On Wednesday, October 16, 1985, the delegation made a several hour tour of the Gagarin Cosmonaut Training Center at Star City. This training center is located about 30 kilometers Northeast of Moscow.

The delegation was greeted by the following officials of the training center:

- o Maj. Gen. Andriyan Nikolayev, Deputy Commander
- o Maj. Gen. Alexei Leonov, Deputy Commander
- o Maj. Gen. Peter Klimuk, Deputy Commander
- o Maj. Gen. Anatoliy Filipchenko.

Following the initial greeting, the delegation participated in two ceremonial activities--laying flowers at a commemorative statue of Yuriy Gagarin and visiting the commemorative trees that had been planted by United States astronauts prior to the Apollo-Soyuz Test Project (ASTP) mission ten years ago.

After these ceremonial activities, Maj. Gen. Leonov took the delegation on a tour of the training center. This tour included the following:

- o A Soyuz "T" trainer which had been used to instruct crews in launch, rendezvous, docking, reentry, and recovery procedures. An adjacent computer and control room (that was also shown to the delegation) is used to monitor the crew's performance and to provide simulated emergencies to which the crews can respond. The Soyuz "T" trainer was apparently supported by a number of computers.
- o A Salyut mockup. The Soviets freely permitted members of the delegation to inspect all around and through this mockup. It appears as though it may be a fairly high fidelity mechanical representation of the space station. However, we do not know how closely it reproduces the other characteristics of a Salyut.
- o A large centrifuge facility that has the capability of providing cosmonauts with loads of up to 30 g's. In addition to lateral accelerations, the manned capsule can also introduce a simultaneous tumble.
- o A large water tank for simulating zero-g activities. While we were at the facility, there was a Salyut mockup at the bottom of the tank and several cosmonauts were practicing installing solar panels on the mockup. This impressive facility would appear to indicate a major Soviet commitment to conducting extravehicular activities in space.

BEST COPY AVAILABLE

The last stop on the tour was a visit to the Gagarin Museum. This facility contains many small historical artifacts from the Soviet Space program. Of particular note is one small room that commemorates the memory of the first man to fly in space--Yuri Gagarin. Gagarin unfortunately died in a crash of his jet trainer in 1968. The room contains his desk and chair from his home and many of the awards, citations, and other personal articles that he owned. The clock on the wall is stopped at the time at which he died. Major General Leonov explained that before their space flight, all cosmonauts visit the room to pay homage to their deceased comrade and contemplate their own upcoming space mission.

In bringing our activities to a close, the Soviet officials presented each member of the delegation with a pin that commemorates Cosmonaut Yuri Gagarin and Star City. Mr. Nelson reciprocated by presenting the gifts from our delegation. General Tom Stafford also presented the museum with a number of artifacts from his past space flights.

Unfortunately, the delegation did not have sufficient time available at Star City to discuss substantive issues relating to possible future U.S.-U.S.S.R. joint manned missions.



UNCLASSIFIED  
Department of State

INCOMING  
TELEGRAM

Page 01 NOCOU 1455 ZC OF 01 170142Z  
ACTION H-01

2719

INFO 104-00 COPY 01 104-10 104-00 104-00 104-01 104-01  
FM-10 FM-02 02-09 ACN-12 10-02 104-01 104-01  
CART-01 104-01

0 170142Z OCT 64  
FM AMEMBASSY MOSCOW  
TO USINFO WASHDC IMMEDIATE  
INFO DEPTSTATE WASHDC IMMEDIATE 6070  
RUC02000 104-01400

MUSKAS SECTION 02 OF 07 NOCOU 1455

USINFO FOR PARIS, FOR DEF

STATE FOR EMB/COV, W, 001

TELEGRAM FOR SPANISH/01

I 0 12300Z WIA  
SUBJECT: COREL NUCLEAR MOSCOW PRESS CONFERENCE.

1100P IN SPACE. THERE ARE NO PROBABILITIES FOR  
COOPERATION IN SPACE. OVER THE COURSE OF OUR DISCUSSIONS,  
OF WHICH WE HAVE BEEN VERY RECEPTIVE EXCEPTIONALLY SO  
AT MOSCOW CONFERENCE, WHICH WE VISITED ON MONDAY, YESTER-  
DAY WHEN WE VISITED THE ACADEMY OF SCIENCES RE-  
SEARCHING, AND A LUNCH WITH THE VICE - THE SENIOR  
VICE PRESIDENT NOTING THAT THROUGHOUT FOR US - AND THEN  
YESTERDAY AFTERNOON TO DOCTOR LITVINOV'S LECTURE ON  
SPACE MEDICINE IN WHICH HE HAD A FASCINATING TIME WITH  
HIM, SEEING SOME OF HIS EXPERIMENTS, AND SEEING SOME OF  
HIS HARDWARE, AND THEN AGAIN TODAY, BEING THE FIRST  
OFFICIAL AMERICAN, THAT HE KNOWS OF SINCE TOM STARTED  
AND DERE JATION AND SPACE ARMS WERE IN THEIR TRAINING  
TEN YEARS AGO - TO GO TO STAR CITY AND HAVE AN  
EXTENSIVE TOUR, AN EXCHANGE OF GREETINGS, OF COURSE  
YOU UNDERSTAND PART OF THE UMBRELLA UNDER WHICH WE ARE  
OPERATING, HAS BEEN THAT THIS IS THE TENTH ANNIVERSARY  
OF APOLLO 10000. I HOSTED A RECEPTION IN WASHINGTON  
FOR THE COSMONAUTS WHEN WE HAD A REUNION BETWEEN THE  
ASTRONAUTS AND THE COSMONAUTS, AND WE HAVE ENJOINED TWO  
OF OUR THREE ASTRONAUTS, WERE WITH US IN THIS DELE-  
GATION. AND SO HE WENT TO THAT KIND OF PARTICIPATION  
WE WERE MET AT THE AIRPORT SATURDAY AFTERNOON BY THE  
TWO COSMONAUTS, AND THEY ARE BOTH GOING TO SEE US ONE  
TONIGHT WHEN WE DEPART THIS EVENING, ABOUT EIGHT O'CLOCK  
AFTERNOON, LET ME CALL YOU SENIOR REPRESENTATIVE OF THE  
SCIENCE AND TECHNOLOGY COMMITTEE, MINISTRE LOUIN OF NEW  
MEXICO, FOR HIS COMMENTS, AND THEN WE WILL OPEN IT UP  
TO YOUR QUESTION.

REP (H-01) THANK YOU VERY MUCH, BILL. WILL BE BECOM-  
ING TO YOU THE VARIOUS PROGRAMS THAT WE HAD SPOKE  
TO, OF COURSE, THE PRESIDENT, AND THE VARIOUS INSTITUTES  
THAT WE HAVE VISITED. I WOULD DESCRIBE TO YOU THE  
FEELING AS I WENT THROUGH THE ENTIRE FOUR DAYS, BECAUSE  
IT REAFFIRMS THE FACT THAT WE WERE RIGHT IN COMING  
AND TRYING TO DO WHAT WE CAN IN THE COOPERATIVE PROGRAMS  
IN THE CIVILIAN SPACE PROGRAM. AND UNDERSTAND THAT OUR  
AREA IS DIRECTLY THE CIVILIAN PROGRAM. AS WE WENT  
THROUGH ALL OF THESE ACTIVITIES AND OUR DISCUSSIONS  
WITH ALL OF THESE PEOPLE, ONE OF THE THINGS THAT SURVIVED  
ME MORE THAN ANYTHING ELSE, IS THAT WE WERE DOING THE  
SAME THINGS, THAT WE WERE. THE SAME SCIENCE EXPERIMENTS,  
PERHAPS NOT EXACTLY THE SAME, BUT IN THE SAME FIELD,  
THE SAME PHYSICAL EXPERIMENTS, IN ENERGY AND SOME DIS-  
PERSSIONS OF FUSION, AND OF COURSE YOU KNOW THAT I BEEN  
ONE OF OUR NEW ON-GOING COOPERATIVE PROGRAMS - INTEREST,

COI. THE KIND OF WORK THAT WE. THE KIND OF RESEARCH  
WORK THAT WE DO IN. DO GO ON IN THE CIVILIAN AREA. SO  
THAT IT JUST SEEMS TO ME, THAT WE AS BOTH SIDES, THE  
SAME THINGS, THAT IF WE DID IT TOGETHER, THAT IN FACT WE  
COULD DO IT BETTER AND CHEAPER AND SWIFTER. BUT THIS  
EVENING, WHILE IT MAY NOT HAVE BEEN AS ENLIGHTENING AS  
IT WAS WITH THE AMERICAN SCIENTISTS, WHO WERE VERY EAGER  
TO WORK IN DIFFERENT AREAS TOGETHER. IT WAS STILL NOT A  
BAD MEETING, AND NOT ONE WHERE WE GOT HOME. WE HAD  
OUR MEETING, AND THE AMERICAN THAT WE HAD IS WHAT BILL  
SPOKE ABOUT, AND OF COURSE THERE AGAIN, THEY HAD THEIR  
AGENDA, WHICH WAS THE PARTY LINE, ESPECIALLY, "ALSOHOD  
SOI AND WE WILL TALK TO YOU." BUT THEY DIDN'T LET IT  
OCCUR UNTIL THAT MORNING. THEY DID SAY THAT THEY WERE  
PRIVATELY, AS FAR AS THEY WERE CONCERNED, THE PRESIDENT  
THINKS THAT, ONE DID NOT CLOSE THE BOOK. ONE OF  
THE COMMENTS, THAT I WANTED TO MAKE LAST, THAT THEY KNOW  
THAT WE DID NOT COME HERE IN HAND, ACTING, THEN FOR ANY  
OF THEIR EXPERTISE WITHOUT US CONTRIBUTING SOMETHING  
TO IT, BUT ONLY THAT WE HAVE, THAT WE COOPERATE IN PRO-  
GRAMS, IN A CIVILIAN MANNER THAT ARE OF ADVANTAGE TO  
BOTH NATIONS. SO WHILE IT WAS NOT A MEETING THAT I  
CAME AWAY WITH A STRONG FEELING OF COOPERATION, IT WAS  
ONE WHERE THEY STUCK TO THEIR MAIN POLICY MUCH. BUT  
THE DOOR IS NOT CLOSED, AND DEPENDING ON WHAT HAPPENS  
IN WASHDC, IT COULD BECOME GOOD ARRANGEMENTS ARE MADE,  
WE SEE GREAT COOPERATION. IF SOME GOOD ARRANGEMENTS,  
FROM THEIR POINT OF VIEW, ARE MADE, I STILL SEE  
THAT WE WOULD BE DOING SOME OF THE SAME WORK THAT WE  
DOING NOW, AND PERHAPS, THEY DO OTHER JOINT PROJECTS.  
THOSE WERE MY GENERAL THOUGHTS, OF YOUR DAYS AND  
TODAY'S MEETING.

UNCLASSIFIED

BEST COPY AVAILABLE

UNCLASSIFIED  
Department of State

INCOMING  
TELEGRAM

PAGE 01 MOSCOW 10050 03 OF 07 170744Z

2728

ACTION 2-21

INFO LNO-09 COPY-01 IIR-10 EOP-00 SS-09 PMO-01 ANAD-01  
PO-10 PO-02 RES-09 NSR-12 SP-02 PES-01 SARR-01  
DART-01 /054 V

\*\*\*\*\*030172 170003Z /11/78

O 170710Z OCT 80

FM AMEMBASSY MOSCOW

TO USINFO WASHDC IMMEDIATE

INFO DESTATE WASHDC IMMEDIATE 0479  
AMEMBASSY LEBERHARD

UNCLAS SECTION 03 OF 07 MOSCOW 10050

USINFO FOR P/032, UOA/000

STATE FOR EUE/00V, N, OCS

LEBERHARD FOR UPD/CALL(0)

C.O. 12300: N/A

SUBJECT: CIOCEL NELSON MOSCOW PRESS CONFERENCE,

REP NELSON: BEFORE I INTRODUCE CONGRESSMAN BITTER, LET ME TELL YOU THAT ONE THING THAT DR. GUDENOV HAS AND CONSIDERABLE INTEREST IN IS SOME OF OUR SPACE MEDICINE DATA. AND WE, OF COURSE, ARE QUITE INTERESTED IN THE LONG DURATION FLIGHTS, OF WHICH THE SOVIETS HAVE HAD CONSIDERABLY LONGER DURATION, AND THEIR MEDICAL DATA UPON THE EFFECTS OF THE BODY. AND SO WE SUGGESTED AN EXCHANGE. AND AS A SIGN OF GOODWILL AND SOMEONE COMING DIRECTLY FROM OUR EXPERIENCE, I AM PROPOSING -- THE DETAILS OF WHICH I CANNOT RELATE TO YOU AT THIS POINT UNTIL I GET THE FINAL APPROVAL OF THE PARTICULAR HUSSION, BUT WE'VE CHECKED THIS OUT WITH NASA ALREADY -- AND THE EXPERIMENT IS CORRECT, IS OK -- BUT I AM PROPOSING AN EXPERIMENT WHICH I WILL CONDUCT UPON MYSELF IN SPACE IN DECEMBER. AND THE DATA FROM THAT WOULD BE SHARED WITH THE SOVIETS AS A GOODWILL GESTURE, WITH THE UNDERSTANDING THAT THERE WOULD BE AN EXCHANGE OF DATA FROM THEIR MEDICAL DATA ON LONG DURATION SPACE FLIGHT. AND MORE DETAILS WILL COME OUT ON THAT AS WE PROCEED. NOW WE, WITHOUT HESITATION, RAISED IN THIS MEETING AS WELL AS OUR MEETING YESTERDAY WITH THE ACADEMY OF SCIENCES, THE QUESTION OF HUMAN RIGHTS. AND I WOULD LIKE MY CHALLENGE, DR. BITTER FROM PENNSYLVANIA, TO SHARE WITH US SOME OF HIS COMMENTS ABOUT THAT.

REP. BITTER: I WOULD LIKE TO START BY SAYING THAT ANY TIME A GROUP OF AMERICAN CONGRESSMEN CAN SIT DOWN WITH HIGH LEVEL SOVIET OFFICIALS AND TALK CONSTRUCTIVELY ABOUT JOINT EXPERIMENTS IN SCIENTIFIC OR UNUSUAL ENDEAVORS, THAT IS A PLUS. ANY TIME A GROUP OF AMERICAN CONGRESSMEN CAN SIT DOWN WITH PRESIDENT GUDENOV AND DISCUSS THE POTENTIAL FOR A JOINT RELATIONSHIP, THAT'S A PLUS. I LIVED HERE 10 YEARS AND AS AN EXCHANGE SCIENTIST AS PART OF THE NATIONAL ACADEMY -- SOVIET ACADEMY EXCHANGE PROGRAM. AND I BELIEVE FIRMLY IN THE IDEA OF SCIENTIFIC EXCHANGES, TECHNICAL EXCHANGES, PROMOTING STEPS FORWARD IN THE MIDST OF RATHER SEVERE DISAGREEMENTS ON MAJOR POLICY MATTERS. NOW IT IS IN THAT SPIRIT THAT I'D SIMPLY LIKE TO REFLECT ON SOME OF OUR EXPERIENCES. ON ONE OF THE NIGHTS, ONE OF OUR GROUPS IN THE EVENING WENT TO VISIT WITH VLADIMIR SLEPAN, WELL-KNOWN REFORMER. THAT SAME NIGHT, OTHER MEMBERS WENT TO VISIT WITH THE UNOFFICIAL PEACE MOVEMENT IN THE SOVIET UNION, HEADED UP BY YURI MEDVEDEV. ON ANOTHER EVENING,

A GROUP WENT TO VISIT WITH A LARGE GROUP OF SOVIET REFUGEES, INCLUDING ALEXANDER LEARNER, VIKTOR BRYLOVSKI, MARK YARSHIS, AND SOME 15 OR 16 OTHERS. AND I GUESS ITS A TOUGH CHOICE THAT OUR COUNTRY IS GOING TO BE FACED WITH. NOT ON THE PART OF GROUPS LIKE OURS, BUT FOR THE PRESIDENT IN GENEVA. THERE ARE OBVIOUS STRONG VIOLATIONS OF HUMAN RIGHTS IN THE SOVIET UNION. I MIGHT ADD THAT PRESIDENT GUDENOV REFERRED TO PRESS REPORTS OF SUCH CONDITIONS AS THE DEATH IN PRISON OR LABOR CAMPS OF SOME 5 HELSINKI MONITORS IN THE LAST TWO YEARS, SOME OF WHICH WERE IN THEIR 30'S AND 40'S, AS DISINFORMATION. ITS NOT AN ACKNOWLEDGED QUESTION, AT LEAST PUBLICLY, BUT ITS GOING TO BE A TOUGH CALL FOR OUR ADMINISTRATION, FOR THE NEGOTIATIONS, AS TO WHERE WE SUPPORT THE CAUSE OF HUMAN RIGHTS, AND CERTAINLY THE HUMAN RIGHTS GROUPS THEMSELVES ARE UNANIMOUS IN WANTING THE UNITED STATES TO LIMIT THE SCIENTIFIC EXCHANGES, TO LIMIT THE TECHNOLOGICAL COOPERATION WITH PROGRESS IN HUMAN RIGHTS. I THINK THAT'S IT, AND WE WOULD ALL BE VERY WILLING TO TAKE YOUR QUESTIONS ON THIS. I MIGHT ADD A FEW OTHER THINGS THAT MR. GUDENOV SAID. HE BROUGHT UP -- SINCE HE BROUGHT UP SDI, WE BROUGHT UP SOME OF THE REASONS WHY THE PEOPLE AND THE GOVERNMENT OF THE UNITED STATES HAVE BEEN INTERESTED IN SDI. WE TALKED ABOUT THE SITUATION IN THE HUMAN RIGHTS AREA. WE ALSO TALKED ABOUT AFGHANISTAN, AND THE LINE WAS THAT 11 TIMES THE SOVIET UNION HAS BEEN INVITED INTO AFGHANISTAN. NOW OUR GOVERNMENT HANDLES THIS IN GENEVA IS ANOTHER QUESTION. WHETHER OR NOT THESE EXCHANGES BECOME PART AND PARCEL OF A

UNCLASSIFIED

BEST COPY AVAILABLE

FILED AT: PROCTOR 18c52 04 08 07 107452  
MCI-06, W. D.

229

|      |        |          |        |         |       |        |          |
|------|--------|----------|--------|---------|-------|--------|----------|
| 1000 | 100.00 | COMP. 01 | 100.10 | PRE. 00 | 10.00 | MD. 01 | ATTN. 01 |
| 1010 | 100.00 | COMP. 01 | 100.10 | PRE. 00 | 10.00 | MD. 01 | ATTN. 01 |
| 1020 | 100.00 | COMP. 01 | 100.10 | PRE. 00 | 10.00 | MD. 01 | ATTN. 01 |

0 171122 OCT 85  
FM AMEMBASSY MOSCOW  
TO OJINFO WASHDC IMMEDIATE  
INFO LEGATE MAGNDC IMMEDIATE 6020  
AMCOW,LT (FMUS84)

ENCLOSURE SECTION 04 OF 07 PROJECT NO. COW 14658

W2: THE Q. F. OAK F. 1028. 1028/1028

2000 10 05 10:00 AM

116 JOURNAL OF ENVIRONMENT &amp; DEVELOPMENT

DATE: 12/15/66 BY: R/A

SUBJECT: CODEL WELDON HOLOCOM PNECC CONFERENCE

EARLIER PICTURE IS ANOTHER QUESTION. BUT I ASSUME  
 THAT THIS IS PART OF THE FILE ON THESE  
 EXCHANGES. THANK YOU

HELP. THE DELEGATION INCLUDED EIGHT CONGRESS-  
MEN ON OUR DELEGATION, TWO TWO K. K. K. GENERAL  
STAFFED AND MR. STAYTON, DR. ION PAINE, THE  
PRESIDENT'S CHAIRMAN OF THE PRESIDENT'S NATIONAL  
COMMISSION ON SPACE, AND DR. W. C. AMBROSE. THOSE  
WERE THE LEADER PRESENT AT THE MEETING. ON THE LOWER  
SIDE, IN ADDITION TO THE PRESIDENT WAS ACAC MICHAEL  
VETRE, ACADEMICIAN NOTE KARD, THE TWO CONGRESS-  
MEN AND AMBROSE, AND THEIR SEVERAL OTHER COUNCIL-  
MEN WHOSE NAMES I DID NOT KNOW. BUT WE  
CAN SET THEIR NAMES FROM THE UNBROADCAST, IF THAT'S  
IMPORTANT TO YOU. PLEASE, ANY COMMENTS OR QUESTIONS  
FROM YOU. YES SIR.

Q. I MISSED SOMETHING OF YOUR OFFERING REMARKS  
SO, I ASK THE QUESTION. WHEN YOU TALKED WITH THE  
SOVIETS, ABOUT JOINT MILITARY AND THE EXCHANGE  
OF INFORMATION (BASED) REAGAN ADMINISTRATION ON  
BOTH

B. I COULD NOT HEAR THE LAST PART OF YOUR QUESTION

Q WERE YOU SPEAKING TO THEM AS INDIVIDUAL OPERATORS  
OR AS AUTHORIZED PERSONS, I MEAN AS PERSONS AUTHORIZED  
BY THE REAGAN ADMINISTRATION OR BOTH?

TRIP. HEIDON IS NOW OFFERING AS THE SPACE SHIP  
COMMITTEE IN THE HOUSE OF REPRESENTATIVES, WHOSE  
PURPOSE ON THIS TRIP WAS TO OPEN THE DOOR TO  
DISCUSSIONS. OBAMA I HAVE CLEARED THIS TRIP WITH  
MY HUSBAND AND, INDEED, HAVE CLEARED THIS TRIP WITH  
THE HIGHER LEVELS IN THE WHITE HOUSE. WE HAVE,  
AT A PART OF OUR DELEGATION, THE NUMBER TWO MAN IN  
BAJA, MR. JIMMO MODEL, WHO IS A PART OF THE  
DELEGATION AND WHO IS PRESENT IN THE AUDIENCE WITH HOW  
NOW UNDERSTANDS THE NEED IN WHICH I AM HERE YOUR  
OFFICE. I AM HERE TO ADVISE AND CONSIDERATION. WE  
SEE THE NEGOTIATIVE BEHIND COOPERATION, BUT IN OUR  
GOVERNMENT, WE HAVE A CHAIN OF POWERS, AND A  
COMMUNICATION THAT COMES FROM ONE BRANCH TO THE OTHER,  
AND IS NOT OUR INTENT TO CUT DOWN AND NEGOTIATE  
THE SPECIFICS OF THE COOPERATIVE AGREEMENTS, THAT'S  
LEFT TO THE ADMINISTRATIVE BRANCH OF GOVERNMENT.

HOWEVER, IT IS OUR PURPOSE TO GET THE HOUSE TO DIS-  
CUSSION ABOUT HOUSE CONGRESSIONAL APPROPRIATIONS AND TO  
REFLECT THE WILL, INTEREST, AND THE AMERICAN PEOPLE  
TO THE HOUSE LEADERSHIP, AS WE DID IN THE  
MEETING, ON SUCH MATTERS, SINCE THE PRESENT  
BROUGHT IT UP, ON THE QUESTION OF '01, THE  
VOTES IN CONGRESS FOR '01, THE QUESTION ON THE  
STRONG FEELING IN CONGRESS ABOUT WOMAN RIGHTS, IN  
THE HOUSE UNION

Q FROM YOUR OPENING REMARKS, I JUST WANTED  
TO MAKE CLEAR, IT SOUNDS LIKE FREEDOM - BOOKS  
AND, FAIRLY RECENTLY, THAT WE WERE NOT PROVIDING  
ANY COOPERATION IN FACT, CIRCUMSTANCES, YOU  
CALL FREEDOM COOPERATION, UNLESS THERE IS SOME  
INDICATION OR IN FACT ONE OF THE THREE STATES  
DOES BACK OUT OF THE LOT AND THAT SOUNDS PRETTY  
CLEAR AND PRETTY BRISK FOR ANY TWO BOOKS AND NOT  
QUITE COLD.

TOP: "I DON'T THINK I COULD GET IN TOUCH WITH  
TOP: ANOTHER PERSON. AND I DON'T KNOW WHAT THEY  
WANT TO DO. ABOUT AFTER 1960, I STARTED WITH THE UNITED  
STATES GARDEN IN WILSON. IT WAS CALLED "GARDEN" AND "GARDEN"  
WAS DISCLOSED IN 1960. I THINK AND I DON'T THINK THEY  
WANT TO GO TO THE TABLE IN WILSON. I DON'T KNOW  
WHAT STATEMENTS ARE MADE. I DON'T KNOW HOW TO  
BE A PERSON. BEING HUMAN BEING. I DON'T KNOW. I  
WANT TO BE ACTIVE IN BEING AND I DON'T KNOW  
WHAT I WANT TO BE. I WANT TO BE WITH THEM. I  
WANT TO BE WITH THEM. I WANT TO BE WITH THEM.  
WITH SOME EXISTING DISCIPLINE, AND WITH THE  
OPENING OF FACILITIES. I DON'T KNOW HOW TO BE WITH

UNCLASSIFIED

BEST COPY AVAILABLE

# UNCLASSIFIED Department of State

## INCOMING TELEGRAM

PAGE 01 MOSCOW 1455N AS OF 07 190212Z

ACTION R-21

\* INFO LOC-00 COPY-01 IIR-10 (L2-00 55-00) PMS-01 ROAD-01  
PA-10 PA-02 DKS-00 ACDA-12 TP-02 PMS-01 SARN-01  
SANT-01 /054 V

-----200000 1000702 /16

D 170102Z OCT 85  
FM AMEMBASSY MOSCOW  
TO USINFO WASHDC IMMEDIATE  
INFO SECSTATE WASHDC IMMEDIATE APTI  
AMEMBASSY Leningrad

UNCLAS SECTION 05 OF 07 MOSCOW 1455N

C O R R E C T E D C O N T E N T

USINFO FOR P RSE, VOA/RVV

STATE FOR EUR/DOV, N, DES

LENTINRAD FOR RPA/IAL, NI

E O 12356 N/A

SUBJECT: CODE: NELSON MOSCOW PRESS CONFERENCE,

TO OFFICIAL DELEGATIONS FROM AMERICA IN THE LAST  
TEN YEARS, SINCE OUR ASTRONAUTS WERE TRAINING  
WITH THE COCHONAUTS THAT'S POINT NUMBER ONE  
AND THEN POINT NUMBER TWO IN THE EXTENSIVE  
DISCUSSIONS THAT WE'VE HAD AT THE SPACE RESEARCH  
INSTITUTE WITH MR. GAGGE, ACADEMICIAN SOURCE,  
THEN WITH THE ACADEMY OF SCIENCES, WITH THOSE TWO  
ACADEMICIANS THAT I MENTIONED TO YOU THAT WERE AT  
THE MEETING, AND THEN WITH THE SENIORITY MEETING  
TODAY, THE WILLINGNESS TO SIT DOWN AND TO TALK  
WAS THERE THE ENTERTAINING OF THE IDEAS, WHILE  
AT THE SAME TIME EXPONING THEIR BELIEFS, AS STATED  
EARLIER NOW THOSE ARE ISSUES -- THE QUESTION  
OF ARMS CONTROL AND ISSUES THAT WERE NOT TO BE  
SOLVED IN THIS AFTERNOON'S MEETING THAT'S AN  
ISSUE TO BE SOLVED BY OUR PRESIDENT AND THE GENERAL  
SECRETARY AND ALL OF THEIR DELEGATIONS AS THEY  
START TO MEET AND EXPAND THE GENEVA NEGOTIATIONS  
SO MY OVERALL IMPRESSION IS THAT THE DOOR HAS BEEN  
PARTIALLY OPENED, AND WHETHER OR NOT IT WILL BE  
CLOSED OR OPENED FURTHER, WE'LL HAVE TO SEE, AND  
WE CAN JUDGE THAT FROM WHAT IS PRODUCED AT THE  
SUMMIT.

REP. WITTER: BILL, COULD I JUST ADD THAT THERE IS A  
GENERAL INTEREST IN THE SCIENTIFIC EXCHANGES, AND THAT  
WHenever THEY DELINEATED, THEY DELINEATED VIS-A-VIS  
THE SSI AND SPACE COOPERATION, AND AT NO POINT DID THE  
SOVIETS DENY THE DESIRABILITY OF AN ENHANCED AND  
ACCELERATED PROGRAM IN SCIENCE AND TECHNOLOGY EXCHANGE.

REP. NELSON: ALL OF THE MEETINGS WITH SCIENTISTS, THERE  
HAS BEEN EXTREME INTEREST THAT HAS BEEN SHOWN WITH  
REGARD TO SOME OF THESE PROJECTS THAT I'VE MENTIONED,  
AND THERE ARE MORE THERE'S A PROJECT CALLED RADIO  
ASTRONOMY THAT, YOU KNOW, WE CAN GO THROUGH ONE RIGHT  
AFTER ANOTHER IN A LOT OF DETAIL, BUT THERE HAS BEEN  
GENUINE INTEREST, AND WE'RE POLITICIANS, WE CAN READ  
PEOPLE, THAT'S OUR BUSINESS THERE WAS BEING GENUINE  
INTEREST AT THE SCIENTIFIC LEVEL AND AT THE INSTITUTE  
LEVEL ANTHONY VICE PRESIDENT OF THE ACADEMY WAS --  
IT'S QUANTITATIVE -- WE SPENT A GOOD COUPLE OF HOURS WITH  
HIM, FURTHER ENTHUSIASM TO THEM ABOUT COOPERATION,  
EXCEPTIONAL ENTHUSIASM, I MIGHT SAY, IN EACH OF THESE  
INSTITUTES, TO SHOW US THEIR WORK IN THEIR FACILITIES,

INCLUDING THE BIOMEDICAL SPACE RESEARCH -- WHAT'S THE  
NAME OF THE PROGRAM?  
VOICE: INSTITUTE OF BIOMEDICAL PROBLEMS  
REP. WITTER: YOU KNOW WE VISITED THEIR STAR CITY, AND  
WHAT WAS IRONIC, FOR US, THE SOVIETS ALWAYS REFER TO  
OUR SPACE ACTIVITIES VIS-A-VIS JOY AND EVEN THE SHUTTLE,  
IF YOU SEE THE CARTOONS, AS MILITARIZING SPACE, BUT  
THE IRONIC THING IS THAT THEIR ENTIRE SPACE PROGRAM  
IS UNDER THE REGIS OF THE MILITARY, AND ESSENTIALLY  
THERE REALLY IS NO INDEPENDENT CIVILIAN SPACE EFFORT  
THAT'S QUITE OBVIOUS WHEN YOU VISIT A PLACE LIKE STAR  
CITY.

REP. NELSON: PRESIDENT GORBYHOD HAD AN INTERESTING  
COMMENT WHEN, IN MY REMARKS, I PROPOSED THAT SINCE I  
HAD SPOKEN WITH THE COCHONAUTS IN THE SPACE STATION A  
-- I OF DAYS AGO, THAT I BRING THEM GREETINGS AGAIN  
MR. J. CHRISTMAS TIME, THIS TIME FROM SPACE, AND HE  
INTERJECTED AND HE SAID, "YOU MEAN YOUR MILITARY WILL  
ALLOW YOU TO DO THAT?" AND I SAID, "YES -- WELL, OF  
COURSE, IT'S NOT THE MILITARY THAT'S OPERATING THE  
AMERICAN SPACE SHUTTLE, IT'S NASA, AND I'VE ALREADY  
TALKED TO NASA SPECIFICALLY ABOUT -- TECHNOLOGICALLY,  
OF COURSE, WE COULD DO IT, IT'S JUST A QUESTION OF  
WHETHER OR NOT THE GOVERNMENTS WANT TO AGREE FOR SUCH  
A MONITOR AND SUCH A GREETING TO OCCUR, AGAIN, YET."

O. BILL, SPECIFICALLY, WHAT DO YOU WANT TO DO BETWEEN  
NOW AND THE SUMMIT IN RESPONSE TO THAT? SOME SPECIFIC

REP. NELSON: I WILL PERSONALLY GIVE A REPORT TO,  
ALONG WITH JESS MOORE, TO JIM BEARD, THE HEAD OF NASA,  
AND I WILL ALSO OFFER TO GIVE A REPORT TO THE WHITE  
HOUSE, ALREADY THERE WILL BE AN EXTENSIVE REPORT THAT

UNCLASSIFIED

BEST COPY AVAILABLE

UNCLASSIFIED  
Department of State

INCOMING  
TELEGRAM

PAUL 01 MOSCOW 14556 PM OF 07 197812  
ACTION 0.22

7721

TIME 10:00 COPY-01 118-10 198-00 11-09 198-01 198-01  
IN 10 PA-02 001-09 AC04-12 12-07 198-01 198-01  
COPY 01 001-09

026277 170046Z 11/73

O 170710Z OCT 85  
FM AMEMBASSY MOSCOW  
TO RUSSIAN SPACECRAFT OPERATORS  
INFO DEUTSCHE WELCHE IMMEDIATE SUBJ  
AND/OR DEUTSCHE

UNCLAS SECTION 06 OF 07 MOSCOW 14556

WORLD FOR P-27, 000-000

STATE FOR 1987-09, 001-09

LENNING-000 0700-0101

E O 12756 W/A

SUBJECT CODE: MOSCOW PRESS CONFERENCE.

WILL BE PREPARED BY THE AMBASSADOR AND SENT ON THROUGH  
THE CHANNELS OF THE STATE DEPARTMENT. BUT I INTEND TO  
INDICATE TO OUR SECRETARY OF STATE SHOULD THAT IF HE  
WOULD LIKE ME TO GIVE HIM A FIRST HAND IMPRESSION OF  
THIS MEETING, AS WELL AS OUR DELEGATION, THAT WE WILL  
BE HAPPY TO DO SO.

REP. LUTZ: AND OUR REPORT TO CONGRESS.

REP. NELSON: AND OF COURSE WE WILL HAVE AN EXTENSIVE  
REPORT THAT WE WILL PREPARE TO THE CONGRESS.

O YOU MENTIONED ABOUT TRYING TO GET THE IDEA OF  
RENEWAL OF THE COOPERATION AGREEMENT ON THE HORIZON  
FOR THE FUTURE?

REP. NELSON: YES. AS A MATTER OF FACT, THAT'S ANOTHER  
THING, VERY INTERESTING, THAT WE PICKED UP YESTERDAY.  
THAT THE QUESTION OF WOULD THE COOPERATION AGREEMENT  
THAT WAS LOST -- LET US SAY IN 1922 -- BE REINSTITUTED  
THE ADMINISTRATION, OUR U.S. ADMINISTRATION, HAS  
SUGGESTED THAT IT WAS INITIALLY REBORN. WE  
HEARD SOME COMMENTS YESTERDAY THAT INDICATED THAT  
THERE MIGHT BE A NEW CONSIDERATION OF THAT. ANOTHER  
CONTEXT IN WHICH THIS DISCUSSION CAME UP WAS THAT SON  
WILSON OF PENNSYLVANIA, MY HONORABLE REPUBLICAN ON THE  
COMMITTEE, AND I HAVE INTRODUCED A CONCURRENT  
RESOLUTION CALLING FOR 1987 TO BE THE INTERNATIONAL SPACE  
YEAR, REMEMBERING THE INTERNATIONAL WOODWORTH YEAR THAT  
WAS SET IN THE LATE FIFTIES, AND ALL OF THE COOPERATIVE  
VENTURES, INTERNATIONALLY THAT HAVE COME OUT OF THAT, IN  
1987 THE INTERNATIONAL WOODWORTH DISCOVERY. THE FACT  
THAT 1987 IS THE 15TH ANNIVERSARY OF THE END OF  
CUBA, THE FACT THAT IT IS THE 75TH ANNIVERSARY OF THE  
REVOLUTION IN THIS COUNTRY, THE FACT THAT IT IS THE  
50TH ANNIVERSARY OF CHRISTOPHER COLOMBUS' DISCOVERY  
OF THE NEW WORLD, ALL BRINGING HOME THAT THAT  
MIGHT BE A YEAR IN WHICH SOVIETS AND AMERICANS COULD  
TOGETHER, AS A FOCUS POINT, FOR COOPERATIVE VENTURES.  
I GAVE A COPY OF THAT BILL THAT I FILED IN THE CONGRESS  
TO THE PRESIDENT TODAY, AND A COPY YESTERDAY TO  
THE ACADEMY OF SCIENCES, AND THEY SEEMED VERY INTERESTED.  
WE GOT SOME VERY POSITIVE FEEDBACK FROM THE TWO  
ADMINISTRATIONS IN THE ACADEMY YESTERDAY, NOTHING TO SEE  
FROM THEIR SIDE THAT POINTED TO AN AGREEMENT WITH THE  
U.S., BUT NO COMMENT YET FROM PRESIDENT GORBACHEV.

REP. LUTZ: BILL THERE WAS ANOTHER THING THAT WE  
SHOULD NOT MISS IN THIS WHOLE DISCUSSION ABOUT WHY THE  
BOOK WAS NOT CLOSED. WHILE THE PRESIDENT KEPT SAYING  
ABOUT COI AND, YOU KNOW, A DIRECT PDA-A-11 WITH THE  
U.S., IF THINGS GOT REALLY BAD, AND THAT SORT OF  
THING, HE ALWAYS KEPT TALKING ABOUT PROBABLY  
PROBABLY THAT COULD INCLUDE THE UNITED STATES. SO  
THAT WAS KIND OF ANOTHER INDICATION THAT THAT BOOK  
FOR THE FUTURE.

REP. NELSON: AND THAT'S A GOOD POINT, MA'AM, TO  
EXPLAIN TO OUR FRIENDS HERE THAT, INDEED, ALTHOUGH  
WE HAVE NO FORMAL WORKING AGREEMENT WITH THE SOVIETS  
SINCE IT Lapsed IN 1922, INDEED THERE IS UNOFFICIAL  
COOPERATION IN SPACE. THERE ARE TWO EXPERIMENTS,  
AMERICAN SOVIET, WITH RUSSIA'S COOPERATION,  
THAT HAVE TWO EXPERIMENTS, ON THE SOVIET RUSSIA  
SPACECRAFT THAT IS GOING TO SEND DOWN WITH MIKEY 2,  
COME. ONE EXPERIMENT ON THE SPACECRAFT, ANOTHER  
EXPERIMENT ON THE BALLOON THAT WAS RELEASED FROM THE  
SPACECRAFT AS IT IS PLUNGING INTO AND FLOATING IN  
THE JOINT ATMOSPHERE -- NOT JOINT, IN THE  
JOINT ATMOSPHERE. AND, IN ADDITION TO THAT  
THE SOVIETS AND THE EXPERIMENT ARE DEPENDING ON THE  
PART FROM OUR DEEP SPACE NETWORK TO HAVE THE ACCURATE  
TRACKING DATA, IT NOT FOR THE FIRST SPACECRAFT  
WHICH IS, WELL, THEN FOR A COOPERATIVE RESEARCH FROM  
GLOBE, THEN THE SOVIET, EUROPEAN SPACE AGENCY  
SPACECRAFT, WHICH IS COMING BEHIND THE SOVIET  
SPACECRAFT IN RESEARCHING WITH MIKEY 2. SO  
THERE ARE THESE UNOFFICIAL COOPERATION, AND COLLABORATION  
THAT ARE GOING ON.

UNCLASSIFIED

BEST COPY AVAILABLE

UNCLASSIFIED  
Department of State

INCOMING  
TELEGRAM

PAGE 01 MOSCOW 14558 07 OF 07 170747Z 2728  
ACTION H-01  
INFO LOO-00 COPY-01 INR-10 EUR-00 SS-00 NMO-01 AMAD-01  
PM-10 PA-02 OES-09 ACDA-12 SP-02 PRS-01 SARN-01  
SART-01 /054 W -----026302 170004Z /11

O 170718Z OCT 85  
FM AMEMBASSY MOSCOW  
TO USINFO WASHDC IMMEDIATE  
INFO SECSTATE WASHDC IMMEDIATE 0003  
AMCONSUL Leningrad

UNCLAS SECTION 07 OF 07 MOSCOW 14558

USINFO FOR P/RSE, VOA/BRU

STATE \*DR EUR/DOV, H, OES

LEningrad FOR SPAD (ALLIN)

E.O. 12356: N/A  
SUBJECT: CODEL NELSON MOSCOW PRESS CONFERENCE.

REP. BITTER? ALSO, JWHNEVER THE PRESIDENT WOULD REFER TO THE RELATIONSHIP BETWEEN OUR SDI AND COOPERATION IN SPACE, HE WOULD ALWAYS POINT OUT HOW IF ALL YOU HAD TO DO WAS DO AWAY WITH SDI AND THERE WOULD BE A WIDE-RANGING PROGRAM OF COOPERATION AND THAT IT REALLY SEEMED AS IF THERE WAS SOME VERY SUBSTANTIAL INTEREST ON THEIR PART IN GOING AHEAD WITH THE PROGRAM.

OF YOU HAD MENTIONED YOU, IN TRAVELLING AROUND, YOU DID SEE SOME EVIDENCE THAT THE SOVIETS WERE WORKING ON SDI-TYPE THINGS SIMILAR TO WHAT THE UNITED STATES IS WORKING ON. OF COURSE, THE ADMINISTRATION RIGHT NOW IS MAKING A POINT OF POINTING UP THAT THE SOVIETS, YOU KNOW, IN FACT WORKING ON SOME OF THOSE THINGS. WHAT KIND OF --

REP. LUJAN? NO, I DIDN'T SEE ANY, BECAUSE ALL OURS WERE DISCUSSIONS. I JUST MEANT THAT I POINTED OUT. -- HELL, IN OUR DISCUSSIONS, THE THINGS THAT WE WERE TALKING ABOUT, THE MEDICAL RESEARCH THAT THEY'RE DOING ARE THE SAME THINGS THAT I RUN INTO SOMEPLACE ELSE; HE HIMSELF WAS SAYING THAT, YOU KNOW, HE HAD THIS PARTICULAR RESEARCH GOING ON AND ALL OF A SUDDEN HE GOES TO AN INTERNATIONAL MEETING AND SOMEBODY FROM ANOTHER COUNTRY IS WORKING ON THE SAME THINGS. AND KNOWING SOME OF THE THINGS OF SDI THAT THEY WORKING ON. THAT'S WHY I MAKE THE GENERAL STATEMENT OF, YES, JE'PE DOING THE SAME THINGS, INDEED INCLUDING SDI. NO, THEY CERTAINLY DID NOT ADMIT THAT THEY WERE DOING ANYTHING IN THE SDI, BUT THEY KNOW THAT WE KNOW THEY ARE.

OF I THINK ONE OF YOU SAID THAT ALL SOVIET SPACE AUTHORITY IS UNDER THE MILITARY. THE OTHER DAY, HE WERE TOLD ABOUT A NEW ORGANIZATION CALLED GLAVKOSMOS. DO YOU HAVE THIS AS A NEW COORDINATING BODY OF THE SOVIET SPACE EFFORT? IS IT ALSO A MILITARY ORGANIZATION?

REP. NELSON? I DON'T KNOW THE ANSWER TO YOUR QUESTION. I DON'T KNOW.  
HARTMAN

UNCLASSIFIED

BEST COPY AVAILABLE

CHRONOLOGY OF  
US-USSR SPACE COOPERATION

- o 1962 - Agreement between NASA and Soviet Academy of Sciences led to modest efforts in telecommunications, geomagnetic mapping and meteorology.
- o 1970-1972 - NASA/Soviet Academy agreements covering study and developmental phases of Apollo-Soyuz Test Project (ASTP)
- o 1971 - NASA/Soviet Academy agreement on cooperation in space science and applications (renewed 1974, lapsed 1977)
- o 1972 - intergovernmental agreement (Nixon/Kosygin summit) (renewed 1977, lapsed 1982)
  - endorsed ASTP
  - endorsed agency-to-agency joint working groups in life sciences, planetary research, meteorology and remote sensing
- o July 1975 - ASTP flight
- o late 1977 - Shuttle-Salyut preparations suspended amid worsening political climate
- o January 1980 - Exchanges cut in response to Soviet actions in Afghanistan
- o May 24, 1982 - In response to imposition of martial law in Poland, the US did not renew the intergovernmental space agreement
- o June 1984 - President Reagan announced that the US had proposed a joint simulated space rescue mission
- o October 30, 1984 - In signing Matsunaga Resolution, President Reagan said "... we are prepared to work with the Soviets on cooperation in space in programs which are mutually beneficial and productive."

NASA  
October 2, 1985

BEST COPY AVAILABLE

US-USSR SPACE COOPERATIONBilateral Activities

- o By Presidential decision announced December 19, 1981, the US-USSR Space Cooperation Agreement was not renewed and thus expired on May 24, 1982. Continuing agency-level activities are subject to case-by-case interagency review.
- o Cosmos 1667 Biosat Mission - A NASA primate cardiovascular experiment flew onboard the Soviet Cosmos 1667 biosatellite mission which took place July 10-17, 1985. Mission was a complete success, and US scientists and engineers will participate in post-flight data recording and analysis activities in Moscow beginning in late September. NASA has participated in four previous Soviet biosat missions - in 1983, 1979, 1977 and 1975.
- o Cosmonaut CAT Scanning - Cooperation is continuing in computer tomography pre- and post-flight measurements of Soviet cosmonauts to detect bone mineral changes during spaceflight.
- o Planetary - formal bilateral cooperation ended and no new projects underway since lapse of US-USSR Space Agreement; informal US-USSR dialogue among scientists continuing. A variety of VEGA-related cooperative activities are taking place under multilateral arrangements (see next page).

Multilateral Activities

- o COSPAS/SARSAT Satellite Search and Rescue Program - COSPAS-SARSAT program began in 1979 and has proven the effectiveness of using satellites in detecting and relaying distress transmissions from ships and aircraft in distress. Over 475 lives saved to date. US, Canada, France and USSR are the main contributors in this humanitarian program; additional country participation is taking place by Norway, UK, Finland and Bulgaria.
  - Three Soviet COSPAS and two US SAR-equipped spacecraft launched to date; initial operational phase began in July 1985, and NASA leadership of US participation has been transferred to NOAA.
  - Next COSPAS/SARSAT major coordination meeting to be held in France in April 1986.

- o International Halley's Comet Cooperation (IACG) - The return of Halley in 1986 has generated extensive international cooperation among space agencies with Halley missions:

- European Space Agency's (ESA's) Giotto mission;
- The USSR Interkosmos Council's VEGA-1 and -2 mission;
- Japan's Institute of Space and Astronautical Science MS-T5 and Planet-A missions; and
- NASA's Shuttle/Astro-1 payload and other orbiting US spacecraft. The ICE spacecraft will be used as an upstream monitor of Comet Halley as well.

"Pathfinder" cooperative activity involves use of Soviet VEGA-1 spacecraft and NASA's Deep Space Network to provide near real-time data to ESA in order to permit final trajectory improvement for the Giotto spacecraft. Giotto's targetting error will be reduced from 300-500 km to about 150 km as a result of this multilateral effort, thereby maximizing the conflicting targetting requirements of its scientific payload.

The International Halley Watch (IHW), created in 1981, is a network of over 900 astronomers from 47 countries participating in coordinating and archiving ground-based observations of Comet Halley; it includes significant USSR involvement.

Most recent Halley IACG meeting held September 10-12, 1985 in Washington, DC; next meeting to be held in the USSR and the FRG at time of VEGA and Giotto encounters with Comet Halley, respectively (March 1986).

- o Other VEGA Cooperation - Other US scientific involvement in the VEGA mission through cooperation with French, West German and Hungarian scientists:

- Venus balloon tracking and data analysis (France)
- Venus balloon nephelometer (France)
- Halley dust detector (FRG)
- Halley gas composition experiment (FRG)
- Halley imaging experiment (Hungary)
- Halley plasma experiment (Hungary)

BEST COPY AVAILABLE

Bilateral Science and Technology AgreementsUS-USSR Agreement on Cooperation in the Field of Agriculture

Signed at Washington June 19, 1973 by Secretary Butz and Foreign Minister Gromyko.

Automatically extended for 5 years on June 19, 1978.

Automatically extended for 5 years on June 19, 1983.

Due to expire June 19, 1988.

The Department of Agriculture is now reactivating the Agreement (which has been dormant the past several years) through a Joint Committee meeting, high-level visits, and initiation of new projects. Earlier, the Agreement had supported plant, animal, and soil science research (germ plasm studies) and exchange of grain-related economic information. Exchange visits, especially those involving the private sector, had been particularly active. All of these programs will be reinvigorated.

US-USSR Agreement on Scientific and Technical Cooperation in the Field of Peaceful Uses of Atomic Energy

Signed at Washington June 21, 1973 by President Nixon and General Secretary Brezhnev.

Extended for 3 years effective June 21, 1983.

Due to expire June 21, 1986.

This Agreement provides for cooperative research projects in the fields of controlled thermonuclear fusion, fast breeder reactors, and the fundamental properties of matter. Cooperation takes the form of joint workshops, symposia, meetings, and long-term assignments of scientists to each other's laboratories. Joint activities in fast breeder reactors have now ceased entirely.

US-USSR Agreement of Cooperation in Environmental Protection

Signed at Moscow May 23, 1972 by President Nixon and Chairman Podgorny.  
Automatically extended for 5 years on May 23, 1977.  
Automatically extended for 5 years on May 23, 1982.  
Due to expire May 23, 1987.

Activities under this Agreement have included seminars, joint publications, exchange visits, and joint projects in several topics including protecting endangered species, modeling of long-range air pollution, and earthquake prediction. There are tentative plans to hold the first Joint Environmental Committee Meeting in over seven years sometime this fall.

US-USSR Agreement of Cooperation in the Field of Medical Science and Public Health

Signed at Moscow May 23, 1972 by Secretary Rogers and Minister of Health Petrovsky.  
Automatically extended for 5 years on May 23, 1977.  
Automatically extended for 5 years on May 23, 1982.  
Due to expire May 23, 1987.

US-USSR Agreement on Cooperation in Artificial Heart Research and Development

Signed at Moscow June 28, 1974 by Secretary Kissinger and Foreign Minister Gromyko.  
Automatically extended for 5 years on June 28, 1977.  
Automatically extended for 5 years on June 28, 1982.  
Due to expire June 28, 1987.

The President has directed that steps be taken in the near future to strengthen cooperation under the Agreement on Cooperation in Artificial Heart and the Agreement on Medical Science and Public Health through a renewal of high-level visits, joint committee meetings, and the initiation of new projects and possibly new agreements. These agreements have provided for joint research *inter alia* on laser treatment of glaucoma, congenital heart disease, mechanically assisted circulation in artificial hearts, and cancer treatment and prevention.

US-USSR Agreement on Cooperation in the Fields of Housing and Other Construction

Signed at Moscow June 28, 1974 by President Nixon and Chairman Kosygin.  
Automatically extended for 5 years on June 28, 1979.  
Extended for 5 years effective June 28, 1984.  
Due to expire on June 28, 1989.

Besides exchanges visits and seminars, this Agreement has supported joint research projects in construction techniques in extreme climates and unusual geological conditions, sewage treatment in a permafrost environment, and fire prevention in the design of construction materials.

US-USSR Agreement on Cooperation in Studies of the World Ocean

Signed at Washington June 19, 1973 by Secretary Rogers and Foreign Minister Gromyko.  
Extended for 6 months June 19, 1978.  
Amended and extended for 3 years December 15, 1978.  
Extended 3 years December 15, 1981.  
Currently in the process of renewing the Agreement.

Activities under this Agreement cover five main areas: ocean-atmosphere interaction, ocean dynamics, biological productivity and biochemistry, oceanographic instrumentation, and data exchange. Forms of cooperation have ranged from exchanges of delegations and information to extensive joint research studies, often aboard Soviet oceanographic vessels and to remote regions of the world.

Agreement of Scientific Exchange and Cooperation between the National Academy of Sciences of the USA and the Academy of Sciences of the USSR in 1979 and 1980

Signed at Washington February 7, 1979 by NAS President Handler and ANSSSR Vice President Ovchinnikov.  
Entered into force effective January 1, 1979.  
Agreement expired January 1, 1981 and has not been renewed. Discussions continue on a new agreement.  
Meanwhile, the exchange program is still active.

The basic purpose of this Agreement is to enable individual American scientists to visit and conduct research in the institutes of the Soviet Academy and other research institutions and to facilitate visits to the US by individual scientists whose presence is particularly desired by their American colleagues.

Agreements No longer in ForceUS-USSR Agreement on Cooperation in the Field of Transportation

Signed at Washington June 19, 1973 by Secretary Rogers and Foreign Minister Gromyko.

Amended and extended for 2 years (with a possible 3-year extension) on June 19, 1978.

Cancelled effective June 19, 1983 by President Reagan in response to Soviet downing of KAL airliner.

Under this Agreement we had the following areas of cooperation: civil aviation, tunnel and bridge construction, rail, highway safety, transport of the future (including urban research and development topics), and hazardous materials transport.

US-USSR Agreement on Cooperation in the Field of Science and Technology

Signed at Moscow May 24, 1972 by Secretary Rogers and GKNT Chairman Kirillin.

Interim extension May 24, 1972.

Amended agreement signed July 8, 1977 by the President's Science Adviser Press and GKNT Chairman Kirillin.

Allowed to lapse July 8, 1982 in response to imposition of martial law in Poland.

Under this Agreement we had the following working groups: Chemical Catalysis, Application of Computers to Management, Energy Research and Development, Water Resources, Production of Substances Employing Microbiological Means, Problems of Theoretical Physics, Forestry Research and Technology, Metrology, Standardization, Electrometallurgy, and Intellectual Property.

US-USSR Agreement Concerning Cooperation in Exploration and Use of Outer Space for Peaceful Purposes

Signed at Moscow May 24, 1972 by President Nixon and Chairman Kosygin.

Amended and signed at Geneva May 18, 1977 by Secretary Vance and Foreign Minister Gromyko.

Allowed to lapse on May 18, 1982 in response to the imposition of martial law in Poland.

Under this Agreement we had the following areas of cooperation: the Apollo-Soyuz Test Project, space biology and medicine, near-earth space, the Moon and planets, study of the natural environment, meteorology, and satellite search and rescue systems.

BEST COPY AVAILABLE

US-USSR Agreement on Cooperation in the Field of Energy

Signed at Moscow June 28, 1974 by President Nixon and Chairman Podgorny.

Automatically extended for 3 years June 28, 1979.

Allowed to lapse on June 28, 1982 in response to imposition of martial law in Poland.

Under this Agreement we had the following areas of cooperation: forecasting, hydropower, heat rejection, air pollution reduction, superconducting power transmission, ultra-high voltage transmission, electric power systems, coal, oil, gas, and magnetohydrodynamics (MHD).

April 10, 1985  
Doc.#1141n  
EUR/SOV

## Treaties and Other International Acts Series 7347

Agreement Between the United States of America and the Union of Soviet Socialist Republics Concerning Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes, Signed at Moscow, May 24, 1972

The United States of America and the Union of Soviet Socialist Republics:

Considering the role which the U.S.A. and the U.S.S.R. play in the exploration and use of outer space for peaceful purposes;

Striving for a further expansion of cooperation between the U.S.A. and the U.S.S.R. in the exploration and use of outer space for peaceful purposes;

Noting the positive cooperation which the parties have already experienced in this area;

Desiring to make the results of scientific research gained from the exploration and use of outer space for peaceful purposes available for the benefit of the peoples of the two countries and of all peoples of the world;

Taking into consideration the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies,<sup>27</sup> as well as the Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space;<sup>28</sup>

In accordance with the Agreement between the United States of America and the Union of Soviet Socialist Republics on Exchanges and Cooperation in Scientific, Technical, Educational, Cultural, and Other Fields, signed April 11, 1972,<sup>29</sup> and in order to develop further the principles of mutually beneficial cooperation between the two countries;

Have agreed as follows:

ARTICLE 1.—The parties will develop cooperation in the fields of space meteorology; study of the natural environment; exploration of near Earth space, the Moon and the planets; and space biology and medicine; and in particular, will cooperate to take all appropriate measures to encourage and achieve the fulfillment of the Summary of Results of Discussions on Space Cooperation Between the U.S. National Aeronautics and Space Administration and the Academy of Sciences of the U.S.S.R. dated January 21, 1971.

ARTICLE 2.—The parties will carry out such cooperation by means of mutual exchanges of scientific information and delegations, through meetings of scientists and specialists of both countries, and also in such other ways as may be mutually agreed. Joint working groups may be created for the development and implementation of appropriate programs of cooperation.

ARTICLE 3.—The Parties have agreed to carry out projects for developing rendezvous and docking systems of United States and Soviet manned spacecraft and stations in order to enhance the safety of manned flights in space and to provide the opportunity for conducting joint scientific experiments in the future. It is planned that the first experimental flight to test these systems be conducted during 1975, involving the docking of a United States Apollo-type spacecraft and a Soviet Soyuz-type spacecraft with visits of Astronauts in each other's spacecraft. The implementation of these projects will be carried out on the basis of principles and procedures which will be developed in accordance with the Summary of Results of the Meeting Between Representatives of the U.S. National Aeronautics and Space Administration and the U.S.S.R. Academy of Sciences on the Question of Developing Compatible Systems for Rendezvous and Docking of Manned Spacecraft and Space Stations of the U.S.A. and the U.S.S.R. dated April 6, 1972. [See above].

ARTICLE 4.—The Parties will encourage international efforts to resolve problems of international law in the exploration and use of outer space for peaceful purposes with the aim of strengthening the legal order in space and further developing international space law and will cooperate in this field.

ARTICLE 5.—The Parties may by mutual agreement determine other areas of cooperation in the exploration and use of outer space for peaceful purposes.

ARTICLE 6.—This Agreement shall enter into force upon signature and shall remain in force for five years. It may be modified or extended by mutual agreement of the Parties.

Done at Moscow this 24th day of May 1972 in duplicate, in the English and Russian languages both equally authentic.

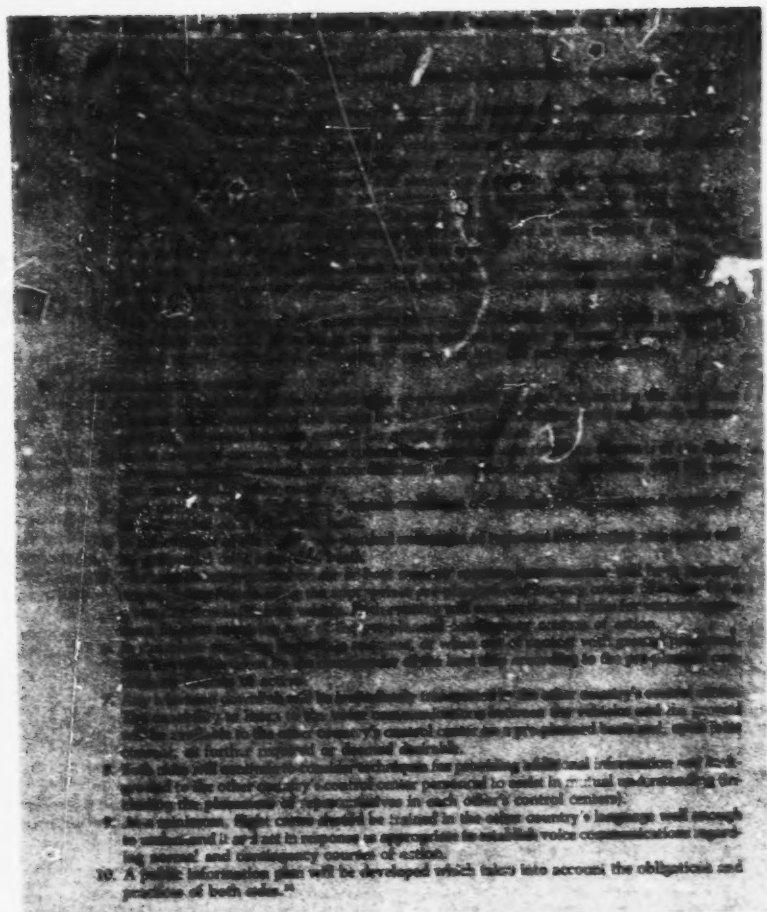
For the United States of America:  
Richard Nixon  
President of the United States of America

For the Union of Soviet Socialist Republics:  
A. N. Kosygin  
Chairman of the Council of Ministers of the U.S.S.R.

<sup>27</sup>TIAS 6347; 18 UST 2410; 610 UNTS 205.

<sup>28</sup>TIAS 6899; 19 UST 7370; 672 UNTS 119.

<sup>29</sup>TIAS 7343; 32 UST 790.



9. Both sides will establish a permanent communication link between the other country's control center and the other country's control center as a pre-planned liaison, which will be subject to further improvement or expansion as needed.
10. Both sides will establish a communication link for providing additional information and for providing to the other country's control center personnel to assist in mutual understanding (including the presence of representatives in each other's control centers).
11. Also, minimum, these codes should be trained in the other country's language well enough to understand it or at least in response to appropriate to establish voice communications regarding general and emergency courses of action.
12. A public information plan will be developed which takes into account the obligations and practices of both sides.<sup>14</sup>

<sup>14</sup>Ball and Ball, *The Partnership*, op. cit., p. 187.

PUBLIC LAW 98-562—OCT. 30, 1984

COOPERATIVE EAST-WEST  
VENTURES IN SPACE

BEST COPY AVAILABLE

98 STAT. 2914

PUBLIC LAW 98-562—OCT. 30, 1984

Public Law 98-562  
98th Congress

## Joint Resolution

Oct. 30, 1984

[S.J. Res. 236]

Relating to cooperative East-West ventures in space.

Whereas the United States and the Soviet Union could soon find themselves in an arms race in space, which is in the interest of no one;

Whereas the prospect of an arms race in space between the United States and the Soviet Union has aroused worldwide concern expressed publicly by the governments of many countries;

Whereas the 1972-1975 Apollo-Soyuz project involving the United States and the Soviet Union and culminating with a joint docking in space was successful, thus proving the practicability of a joint space effort;

Whereas, shortly after the completion of the Apollo-Soyuz project, and intended as a followup to it, the United States and the Soviet Union signed an agreement to examine the feasibility of a Shuttle-Salyut program and an international space platform program, but that initiative was allowed to lapse;

Whereas the United States signed a five-year space cooperation agreement with the Soviet Union in 1972, renewed it in 1977, then chose not to renew it in 1982;

Whereas the United States recently proposed to the Soviet Union that the two Nations conduct a joint simulated space rescue mission;

Whereas the Soviet Union has not yet responded to the substance of this proposal; and

Whereas the opportunities offered by space for prodigious achievements in virtually every field of human endeavor, leading ultimately to the colonization of space in the cause of advancing human civilization, would probably be lost irretrievably were space to be made into yet another East-West battleground: Now, therefore, be it

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled.* That the President should—

(1) endeavor, at the earliest practicable date, to renew the 1972-1977 agreement between the United States and the Soviet Union on space cooperation for peaceful purposes;

(2) continue energetically to gain Soviet agreement to the recent United States proposal for a joint simulated space rescue mission; and

PUBLIC LAW 98-562—OCT. 30, 1984

98 STAT. 2915

(3) seek to initiate talks with the Government of the Soviet Union, and with other governments interested in space activities, to explore further opportunities for cooperative East-West ventures in space including cooperative ventures in such areas as space medicine and space biology, planetary science, manned and unmanned space exploration.

Approved October 30, 1984.

---

LEGISLATIVE HISTORY—S.J. Res. 236:

CONGRESSIONAL RECORD, Vol. 130 (1984):

Oct. 10, considered and passed Senate.

Oct. 11, considered and passed House, amended; Senate concurred in House amendment.

WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 30, No. 44 (1984):

Oct. 30, Presidential statement.

BEST COPY AVAILABLE

## SITE DESCRIPTIONS

## FLIGHT CONTROL CENTER

Address

Kaliningrad, outside of Moscow

Leading-Personnel

- o Vladimir Lobachev - Manager of the Center
- o Valentin Belokuzov - Deputy Manager of the Center
- o Valeri Rumin - Flight Director
- o Aleksey Yeleseev - Director of the Salyut Program
- o Valeriy Kubasov - ASTP Cosmonaut
- o Stepan Bogodjash - Public Relations Officer

Research Areas

Not believed to be applicable.

Description

The Soviet Flight Control Center (FCC), is located outside of Moscow in a suburb referred to as Kaliningrad. It is believed to be the equivalent of NASA's Mission Control Center at the Johnson Space Center in Houston, responsible for all aspects of on-orbit manned spaceflight. It is here that the current Soviet Salyut 7 space mission is being directed. Flight directors apparently are named for the various manned missions, however, it is not known who is in charge of the facility. Some Western journalists and French space officials have visited the FCC, but it is not routinely open to foreign groups.

BEST COPY AVAILABLE

INSTITUTE OF BIOMEDICAL PROBLEMS (IMBP),  
MINISTRY OF HEALTH

Address

Khoroshevskoye Shosse 76A, Moscow D-7

Leading Personnel

|                   |                             |             |
|-------------------|-----------------------------|-------------|
| Director:         | Academician Oleg G. Gazenko |             |
| Deputy Directors: | A. Grigoriev                | Y. Nefedov  |
|                   | Y. Ilyin                    | Y. Volynkin |
|                   | N. Gurovskiy                | B. Yurov    |
|                   | B. Adamovich                |             |

Research Areas

The institute is engaged in many areas of biological research, specifically in the area of space biology and medicine.

Description

Established in 1962, the Institute of Biomedical Problems conducts research supporting the Soviet manned space program, and is responsible for ensuring the safety of cosmonauts. Under the jurisdiction of the USSR Ministry of Health, the institute carries out ground-based scientific research in the space biology (e.g., studying the effects of zero-g on plants and animals), space medicine (countermeasures, space motion sickness, bedrest studies, radiation dosimetry, cosmonaut CAT scans to determine bone calcium loss). Operationally, the institute is responsible for directing the Soviet "Cosmos" biological satellite (biosat) program, a series of unmanned dedicated spacecraft launched since the early 1970s to investigate the effects of spaceflight on living organisms.

NASA has worked closely with the Institute of Biomedical Problems since the early 1970s, and has participated in five Cosmos biosat missions to date. There have been numerous data exchanges in the manned spaceflight area as well.

SPACE RESEARCH INSTITUTE (IKI),  
USSR ACADEMY OF SCIENCES

Address

- Profsoyuznaya Ulitsa 88, 117810 Moscow

Leading Personnel

|                   |                              |              |
|-------------------|------------------------------|--------------|
| Director:         | Academician Roald Z. Sagdeev |              |
| Deputy Directors: | N. Kardashev                 | Y. Khodarev  |
|                   | V. Balebanov                 | G. Tamkovich |
|                   | G. Skuridin                  |              |

Research Areas

Planetary  
Space Plasma Physics  
Experimental Astrophysics  
Theoretical Astrophysics  
Experimental Plasma/Solar-Terrestrial Physics  
Experimental Plasma/Solar-Planetary Physics

Description

IKI was founded in 1965 to centralize and coordinate Soviet civil space programs under the directorship of G.I. Petrov. Today it is the principal Soviet civil space research facility and is frequently visited by American space scientists, particularly those in planetary, space plasma physics and astrophysics. IKI has a staff well over 1,000 people from many academic disciplines. Scientists from the institute have been involved in developing instrumentation for the various Soviet planetary missions, including the Venera, Luna, Mars and VEGA probes. In addition, experiments from IKI have flown on Prognoz, Interkosmos, and Intershock near-Earth space missions.

In mid-1973, R.Z. Sagdeev replaced Petrov as the director of IKI, and the direction of Soviet space research was modified slightly. Under Sagdeev the institute has placed greater emphasis on astrophysical research and on the study of interplanetary plasma and solar-terrestrial interactions. In addition to its traditional cooperation with its East European allies under the "Interkosmos" program, IKI has been involved for many years in cooperative activities with such countries as the US, France, India, and more recently, with the current VEGA mission, has extended its involvement to include working with West Germany (Max Planck Institute), Austria and Sweden. With preparations underway at IKI for the planned 1988 Mars/Phobos mission, cooperation with these countries and the European Space Agency (ESA) is envisioned.

## USSR ACADEMY OF SCIENCES (ANSSSR)

Address

Leninsky Prospect, 14, 117901 Moscow

Leading Personnel

|                       |                                     |
|-----------------------|-------------------------------------|
| President:            | Academician Anatoliy P. Aleksandrov |
| First Vice President: | Academician Vladimir A. Kotelnikov  |
| Vice Presidents:      | P. Fedoseyev      Y. Ovchinnikov    |
|                       | V. Koptug      Y. Velikhov          |
|                       | A. Logunov      A. Yanshin          |

Research Areas

Research is conducted by the Academy's 17 departments, of which the most relevant to space research are:

General Physics and Astronomy  
 Geology, Geophysics and Geochemistry  
 Information Science, Computer Technology and Automation  
 Mechanics and Control Processes  
 Nuclear Physics  
 Oceanology, Atmospheric Physics and Geography  
 Physiology

Description

The USSR Academy of Sciences is the oldest and most prestigious scientific establishment of the Soviet Union. It was founded in 1724 by Peter the Great as the first scientific establishment in Imperial Russia and has played a dominant role in scientific research up to present time. According to a 1982 Academy report, a total of 51,110 scientific personnel were employed by the Academy; these included the following categories:

256 Full Academicians  
 524 Corresponding Members  
 4,461 Doctors of Science (Ph.D equivalent)  
 23,500 Candidates of Science (M.S. equivalent)

The governing authority of the Academy officially resides with its General Assembly, which meets not less than twice a year. The General Assembly, through the Academy's 17 departments, is responsible for directing the work of some 250 research institutes, including approximately 50 under its Siberian Department. In actuality, however, the principal policy-making body appears to be the Presidium, which is comprised of elected Academy officials and certain leading scientists. There are affiliated Academies of Sciences located in each of the 14 Union republics (the Russian SFSR is excluded).

The Academy is responsible for identifying the most important problems in the natural and social sciences and then formulating annual and longer-range plans for research on those problems. In cooperation with the State Committee for Science and Technology, it plans the financing, material supply, and technical support of scientific research. While the Academy's primary function is the conduct of theoretical research, Communist Party General Secretary Mikhail Gorbachev has insisted that it become more heavily involved in applied research as part of the effort to improve the Soviet economy. Academy activities are financed from the national budget. Additional funds are obtained through work conducted under contract with other Soviet organizations.

Election to membership in the Academy is the highest honor a Soviet scientist can achieve. In a country that stresses the "scientific" nature of its political and economic philosophy, the title "Academician" (full member) entails in Soviet society respect bordering on reverence. According to the Academy statutes, in order to be elected as an academician one's work must be of paramount scientific significance.

Academy elections are conducted by secret ballot in the General Assembly. To be elected, nominees must receive the votes of two thirds of the academicians, first at the department level, and finally in the General Assembly. Although the number of membership positions generally remains constant--with individuals being elected to membership only to replace members who have died--occasionally the Council of Ministers will authorize an increase. This appears to have been the case for the most recent election, held in March 1985, at which time the Academy was expanded by approximately 26 full and 64 corresponding members. Many of the new slots were allotted to the Academy's Department of Information Science, Computer Technology, and Automation, created in March 1983. The recent election continued the trend toward increasing the number of academicians who belong to the Communist Party. Currently, at least 72 percent of the academicians are Communist Party members.

INTERCOSMOS COUNCIL,  
USSR ACADEMY OF SCIENCES

Address

Leninsky Prospect, 14, 117901 Moscow

Leading Personnel

Chairman: Academician Vladimir A. Kotelnikov

Deputy Chairmen: G. Balayan  
V. Vereshchetin  
V. Kozyrev (?)

Scientific Secretary: S. Khlemanov

Research Areas

The Intercosmos Council does not conduct research itself, it is a secretariat-type organization within the USSR Academy of Sciences.

Description

The Intercosmos Council is responsible for coordinating Soviet international cooperative space activities and participating in international space law activities such as meetings of the UN Committee on the Peaceful Uses of Outer Space (COPUOS) and meetings of the International Institute of Space Law (sponsored by the IAF). Formally referred to as the "Council for International Cooperation in the Exploration and Uses of Outer Space," it is subordinate to the Presidium of the USSR Academy of Sciences. In addition to its full-time staff, representatives of the major Soviet space research institutes serve in an advisory capacity to the Intercosmos Council in determining policy and procedures for international space cooperation; these high-level scientists and officials are called "members" of the Council.

The Intercosmos Council has been operating since at least 1967, and today is comprised of a staff of approximately 30 individuals. Its major functions are: to consider proposals from Soviet space scientists for international space projects, prepare and negotiate texts of international space agreements, and provide policy advisors on Soviet space delegations traveling to international scientific meetings. The Council is divided into three program areas:

Multilateral cooperation (socialist countries)  
 Bilateral cooperation (Western countries), and  
 participation in major international scientific  
 organizations (e.g., COSPAR and IAF)  
 Space Law

The largest program of Soviet international space cooperation is implemented with its socialist allies in Eastern Europe; it commenced in April 1967. An intergovernmental multilateral agreement to carry out this collaboration (known as the "Interkosmos Program") was signed in Moscow in July 1976 and entered into force in March 1977. Today nine socialist countries are participating in the program: Bulgaria, Hungary, Poland, East Germany, Cuba, Mongolia, Romania, Czechoslovakia, and Vietnam. Multilateral work currently is underway in five disciplines:

- Study of physical properties of outer space
- Space meteorology
- Space biology and medicine
- Space communications
- Study of the natural environment by remote sensing

In addition to the multilateral cooperation noted above, the USSR is cooperating on a bilateral basis with a number of Western countries in space research. The largest joint programs are with France, India, Sweden, the US and recently, the European Space Agency (ESA).

## STAR CITY

Address

Approximately 25 miles northeast of Moscow

Leading Personnel

Commandant: Gen. Georgiy Beregovoi  
Deputy Commandant: Gen. Alexei Leonov  
Chief, Cosmonaut Corps: Gen. V. Shatalov  
Chief, Cosmonaut School: Gen. A. Filipchenko  
Chief, Medicine: Col. Beregovkin  
Director, Salyut Program: A. Yeliseev

Research Areas

Star City is the setting for cosmonaut operational training activities. It is unknown whether research is carried out there as well.

Description

Sometimes referred to as the "Cosmonaut Training Center," Star City reportedly began operations in January 1960 with the first group of cosmonauts training in a metal hut containing merely a Vostok mock-up and a rotating chair. Today it appears to be a primary facility for the Soviet manned space program, and is comprised of cosmonauts, doctors, trainers and engineers. Star City has numerous buildings as well as apartments and is a self-contained entity, not unlike the typical US military base. Included in the large training complex are full-size simulators of manned spacecraft (Soyuz and Salyut), a watertank called a "hydrolab" for EVA simulations, as well as classrooms and other support facilities.

It is believed that at least 50 cosmonauts are in active training status at present. Svetlana Savitskaya, the second Soviet female cosmonaut, has been quoted by Western sources as stating that there are ten females currently in training at Star City.

DATA AVAILABLE

REPORT ON  
POTENTIAL US/USSR COOPERATION IN SPACE

INTRODUCTION

In July 1985, the Subcommittee on Space Science and Applications held two days of hearings to assess potential gains and drawbacks of civilian space cooperation with the Soviets by reviewing the record of past successes and failures.

The hearings focused on the question of whether meaningful scientific cooperation and exchange can and should be encouraged despite the lack of a formal framework and in view of current political relationships and atmosphere between the U.S. and the U.S.S.R. While the hearings assumed that some level of cooperation is desirable, the witnesses were asked to offer their recommendations of the optimum level and kind of cooperation, and to identify gains and drawbacks of cooperating with the Soviets.

The timing of these hearings was particularly appropriate. July marked the tenth anniversary of the Apollo-Soyuz Test Project (ASTP). That historical docking 140 miles above the earth was the high point of U.S./Soviet cooperation in space. There have been a number of joint ventures since that time, but none with the high visibility and success of that mission. In fact, the deterioration of relations between the two countries -- particularly in the last few years -- has prevented further bilateral cooperative efforts on the scale of ASTP. In 1982, the U.S. allowed the U.S./Soviet Space Cooperation Agreement -- which had been in effect for the previous 10 years -- to lapse when martial law was declared in Poland.

Since 1982, some scientific interchanges have continued, however, these have been primarily on an individual level. There continues to persist an interest, albeit uncertain, between the two countries in cooperation in space.

In 1984, the President invited the Soviets to participate in a simulated joint rescue mission, the first formal overture for civilian space cooperation since the lapse of the agreement. The Soviets have not responded favorably to the invitation.

There are indications, such as the renewal of the Agricultural agreement in June, that both governments would welcome some reduction of the tensions that have built up over the last several years. At the July hearing, nearly all of the witnesses agreed that some degree of scientific cooperation is both desirable and beneficial to the United States. Questions were raised about the optimum level of cooperation and the issue of technology transfer.

### WITNESSES

The witnesses were chosen not only for their expertise in U.S./Soviet scientific exchange, but for their past or present involvement with the Soviets. The witnesses included U.S. Government policymakers, the American astronauts who participated in the ASTP, and a panel of prominent U.S. scientists who have continued to cooperate in scientific missions with the Soviets on an individual basis.

On the first day of the hearings, July 30, 1985, the testimony was primarily received from government policy-makers.

#### The Honorable Spark M. Matsunaga (D-HAWAII)

For several years, Senator Matsunaga has played an active role in bringing to the public's attention the importance of cooperation with the Soviets as well as with other space-faring nations. In 1984, the Senator introduced a Joint Resolution, later signed by the President, that called for the renewal of the five-year U.S.-U.S.S.R. space cooperation agreement which lapsed in 1982. More recently, he has introduced a resolution that calls for the designation of 1992 as International Space Year (which has been included in the report for the FY 86 NASA Authorization), and another resolution that calls for President to direct the Administrator of NASA to explore opportunities for coordination between scientific missions to Phobos by the U.S.S.R. in 1988 and to Mars by the U.S.

#### The Honorable James M. Beggs

As the Administrator of NASA, Mr. Beggs, is responsible for overseeing the policies that affect scientific exchanges between the U.S. and other countries, including the Soviet Union. He was also Administrator when the most recent U.S.-U.S.S.R. cooperative agreement expired. NASA is clearly the lead Agency for any international cooperative civilian space agreements, such as those recently negotiated with the Europeans, the Japanese, and the Canadians for the Space Station. If another cooperative agreement is renegotiated with the Soviets for civilian space activity, Mr. Beggs, in his capacity as Administrator would be a primary player.

#### Dr. Nancy Lubin

As project director of the Office of Technology Assessment's study, U.S.-Soviet Cooperation in Space, Dr. Lubin was able to pull together a valuable study as a basis from which to draw policy implications. Dr. Lubin is a recognized expert in Soviet affairs and has also worked on issues of technology transfer and military and civilian manpower in the Soviet Union while at OTA. She was a fellow at Harvard University's Russian Research Center and has spent several years in the U.S.S.R. conducting research on Soviet domestic affairs.

On the second day of hearings, the Subcommittee heard from a representative of the State Department, the Astronauts who participated in the Apollo-Soyuz Test Project, and a panel of scientists who have continued to cooperate with Soviet scientists in the absence of a formal government-to-government agreement.

#### The Honorable Charles Horner

The representative of the Department of State at the hearings was Charles Horner, Deputy Assistant Secretary for Science and Technology. His office has been active in monitoring scientific exchanges that have been pursued on a private basis since the lapse of the formal agreement with the Soviets.

#### Apollo-Soyuz Test Project (ASTP) Astronauts

Unfortunately, the Commander of the Mission, Thomas Stafford was unable to testify because of a prior commitment.

Donald K. (Deke) Slayton: Slayton was the Apollo Module Docking Pilot of the Apollo-Soyuz Test Project mission. He brought to the mission a depth of experience that proved to be invaluable. First named as one of the Mercury Astronauts in April 1959, Slayton became the first Chief of the Astronaut office in September 1962. His extensive aeronautical experience made him a natural for selection for the important ASTP mission.

Vance D. Brand: The only ASTP Astronaut who is still in NASA's astronaut program. Brand's first space flight was as the Command Module Pilot on ASTP. He was originally selected as one of the 19 pilot astronauts in April 1966. He had been a support crewman for the Apollo 8 and 13 missions, back-up command module pilot for Apollo 15 and backup commander for Skylab 3 and 4 missions. He has flown on a total of three spaceflights -- ASTP, STS-5, and STS 41-B. Currently, Brand is assigned to command the STS 61-D which will carry a life sciences payload and a crew of seven.

#### Panel of Scientists

Dr. John A. Simpson: Dr. Simpson is currently the Arthur H. Compton Distinguished Service Professor of Physics at the Enrico Fermi Institute, University of Chicago. Dr. Simpson is a cosmic ray physicist and in 1963 invented a device that would detect extremely small dust particles of cometary or interstellar origin. Because the United States had decided not to participate in its own Halley's Comet mission, Dr. Simpson was approached by the Soviets through a third party and invited to fly his instrument on their Vega 1 and 2 missions to Halley's Comet.

Dr. Bradford A. Smith: Dr. Smith is currently a professor in the Department of Planetary Sciences and in the Lunar and Planetary Laboratory, and Astronomer in the Steward Observatory at the University of Arizona. Dr. Smith was trained as an astronomer and has done graduate research in theoretical and observational planetary geophysics. Dr. Smith is currently a member of the Hungarian team which has an imaging experiment on the Soviet spacecraft VEGA mission to Halley's Comet. His participation on

this Hungarian team is partially the result of the fact that we had no bilateral agreement with the Soviets for cooperation. According to Dr. Smith, the scientific data that results should benefit both the U.S. and the Soviets.

Dr. Harold Masursky: Dr. Masursky is a senior scientist with U.S. Geological Survey in Flagstaff, Arizona. Of the panel of scientists, Dr. Masursky is the only employee of the Federal Government. He has had a long history of cooperating with Soviet scientists in science activities. He has worked with NASA and with the Soviets to make systematic geological maps of the Moon, Mars, Venus and some of the outer planets through several missions. More recently he has been involved in prepared landing site maps for Venus landers on the Soviet Veneras 9, 10, 11, 12, 13, 14 and the current Vega 1 and 2 missions. He feels that the U.S. is benefiting by the panoramic pictures and chemical data that the Soviets have provided us of the Venus surface. The Soviets have also provided us with many radar images obtained by the Venera 15 and 16 missions to assist us in the redesign and improvement of our radar experiment that will fly in 1988 (which will map Venus at a higher resolution and with more complete coverage).

Dr. Harold P. Klein: Dr. Klein retired in June 1984 as the Director of Life Sciences at NASA's Ames Research Center. He is currently scientist-in-residence at the University of Santa Clara in California. Dr. Klein was involved with Soviet space scientists during the ten years that we had a space cooperation agreement as a member of the U.S.-U.S.S.R. Working Group in Space Biology. Dr. Klein's testimony was important because of his long history with his Soviet colleagues in the life sciences, one of the areas of science where it is generally agreed that the Soviets may have the lead.

#### WHAT IS THE CURRENT POLITICAL ATMOSPHERE?

This question was addressed by nearly all the witnesses. Administrator Beggs emphasized that the political relationship between the U.S. and the Soviets is the most important factor in determining the level and the scope of cooperative space activities between the nations. Mr. Charles Herrer, from the State Department, addressed the overall relationship between the two countries, but could offer little advice on the role that space cooperation might play in this relationship. Findings revealed by the Office of Technology Assessment (OTA) and presented by Dr. Nancy Lubin, suggest that foreign policy affects the direction of the U.S./Soviet space cooperation, but the reverse does not necessarily follow. I.e., space cooperation may keep lines of communication open with the Soviets and a means of sustaining good relations, but there is no evidence that it can redirect or reshape the relationship significantly.

The ASTP astronauts generally agreed with the OTA conclusion as well. However, Astronaut Vance Brand felt that expectations for continued improvement in political relations were not realized by ASTP. He also was generally pessimistic that improvements in political relationships could necessarily occur through cooperation.

The panel of scientists were less concerned with the political problems than with the desire to have the opportunity to cooperate with world-class scientists. In fact, Dr. Simpson stated that we should not be deterred by the overall political scene in our efforts to establish a cooperative agreement in space, whether official or unofficial. They all expressed the concern that if we do not cooperate with the Soviets, the Soviets will and are turning to other western European countries and, combined, they will surpass us.

#### SHOULD WE COOPERATE?

Nearly all of the witnesses, with the exception of the State Department witness, responded positively to this question. Administrator Beggs mentioned several areas of current cooperation including (i) joint working groups in space biology and medicine, lunar and planetary research, remote sensing, and meteorology; (ii) COSPAS-SARSAT, which is a satellite-aided search and rescue mission involving not only the Soviets, but Canada and France as well; (iii) NASA's Deep Space Network which combined with France to track two Soviet Vega Spacecraft; and (iv) the latest Soviet Biosatellite -- Cosmos 1667 -- carrying a U.S. primate cardiovascular experiment aboard.

Dr. Lubin of OTA stated that U.S.-Soviet space cooperation can be valuable both scientifically and practically -- especially in the life sciences and planetary research areas.

The panel of scientists were enthusiastic about scientific cooperation. According to Dr. Bradford Smith, we have much to gain and little to lose from increased cooperation with the Soviets. Dr. Masursky, favors cooperation because together we will be able to participate in scientific endeavors not possible to do alone, such as the extensive earthquake prediction program that we share with the Soviets.

Slayton was a strong proponent of a follow-on program to ASTP. Astronaut Brand was in favor of cooperation but was less enthusiastic than his colleague Slayton. While they were not specific as to a project to succeed ASTP, the assumption was that it would be comparable to ASTP in that it would be a highly-visible manned space project.

#### WHAT ARE THE ADVANTAGES AND DISADVANTAGES OF COOPERATION?

According to Administrator Beggs, without a formal agreement in place, it is much easier for a closed society, such as the U.S.S.R., to "play" an open society, such as ours, because they are able to make agreements with private institutions in the U.S. with no enforceable quid pro quo. The panel of scientists reinforced Mr. Beggs' statement by giving personal experiences of how a formal agreement would cut down on the red tape now necessary for scientists to cooperate with their Soviet counterparts.

Mr. Beggs felt that cooperation could yield a number of advantages, even beyond the scientific gain. By cooperation, Mr. Beggs said, the U.S. gains insight into the operation of the Soviet society. Astronaut Brand reinforced Mr. Beggs' conclusion. Direct cooperation eliminates the need to work through third parties. Moreover, cooperation brings insight into what the Soviets are likely to do in the future.

According to Dr. Lubin, there are a number of risks in cooperating. Generally, she observed that the risk increases with the size, scale, and visibility of the project. For instance, if another project on the scale of ASTP were undertaken and were to fail, a symbolic cost to the U.S. could be very damaging in other political and scientific areas. Administrator Beggs and Dr. Lubin concurred in the conclusion that the long lead time required for major hardware necessary for cooperative space science missions can have a genuine risk with changing political conditions.

Of course, in any scientific agreement, there is always the issue of technology transfer. Senator Spark Matsunaga (D-Hawaii) revealed a letter from General Allen, Director of the Jet Propulsion Laboratory, which outlined four types of activities for cooperation. They are: data exchange; coordination of separate missions; exchange of instruments on separate missions; and joint missions. Allen's conclusions about these activities are that the first two have no technology transfer issue; the third may have some risk; and the last activity -- joint missions -- must be examined very carefully for the risk of technology transfer.

The panel of scientists generally agreed that there was more to gain than to lose in cooperation with the Soviets. The general consensus is that we are generally ahead in most fields of science, but that the Soviets are gaining in several areas. In planetary exploration and in the life sciences, the Soviets have gained extensive data and are considered by some in the scientific community to be in the forefront. Dr. Klein stated that the Soviets are ahead of the U.S. in many of the life sciences, such as biological data on bone deterioration, cardiovascular adaptation, and exposure to radiation for extended stays in space. In the area of life sciences, we would need at least another decade to catch up with the Soviets, since our NASA schedule does not include the extended stays that the Soviets have recorded.

#### RECOMMENDATIONS

1. There should be a renewal of a space cooperations agreement with the Soviets.

Nearly all of the witnesses concurred that some degree of cooperation is desirable and a formal agreement facilitates our participants, in particular, to engage in scientific exchanges. Agreement on the degree of cooperation was less unanimous from the testimony of the witnesses.

The most hearty endorsement of a new agreement came from Senator Matsunaga who recommended not only the renegotiation of the agreement, but to begin with cooperation on the space station as a first step toward a mission to Mars.

Mr. Beggs offered the suggestion that the original expired 1982 agreement would be a good framework from which to begin.

The entire panel of scientists, not surprisingly, was enthusiastic in their support of the renegotiation of the bilateral agreement for cooperation.

2. The degree of cooperation must be carefully analyzed by a number of criteria, e.g., scientific justification, cost-benefit, and technology transfer risks.

Cooperation can range from data exchange to scientist-to-scientist exchange to an elaborate manned planetary mission. All have risks and benefits. Dr. Lubin cautioned that the U.S. should have its goals clearly in mind so that the policy can be articulated, defined, and understood before any negotiations are begun.

Dr. Simpson felt that if communications are more open between the two countries we can selectively "exploit" the experiment opportunities under an unspecified set of guidelines that would enhance U.S. space science and would lay groundwork for the future.

3. Other types of space cooperation outside the area of science may be useful as confidence builders.

Dr. Masursky recommended that we fly more astronauts from other countries on the Space Shuttle, and cited the fact that the Soviets have been successful in projecting an image of international cooperation by offering cosmonauts from Third World and Eastern Bloc countries.

4. We should try to pick areas of scientific cooperation that are mutually beneficial.

Mr. Beggs suggested several areas of potential cooperation in the 1980's and 1990's. Planetary studies and life sciences could offer great potential for cooperation. We each have complementary fragments of data which should enhance the knowledge and understanding of each side. Dr. Klein echoed his support for cooperation in life sciences because in his view, the Soviets are probably ahead of the U.S. in this area.

Also the fields of astronomy, astrophysics, and earth sciences offer similar potential as candidates for cooperation.

All panel scientists reiterated their endorsement of more scientist-to-scientist exchanges. This hands-on approach is doubly useful when coupled with a requirement to publish results in a timely fashion.